प्रतिबिम्ब

Yearbook of Students of Environmental Science | Volume 1 | Issue 1



NATURE REFLECTS OUR NATURE

DEPARTMENT OF ENVIRONMENTAL SCIENCE AND ENGINEERING
KATHMANDU UNIVERSITY





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Eco Concern Pvt. Ltd. (EcoConcern) is a social enterprise specialized in designing and utilizing innovative solutions for safe water, sustainable sanitation and healthy environment. As an ecopreneur, EcoConcern develops and promotes environmentally friendly WASH products and services.



Eco Concern provides following WASH services:

- Environmental analysis services: Comprehensive laboratory analysis for microbial, chemical and physical analysis of water, waste-water, fecal sludge, soil, food and air.
- Production and marketing of water and sanitation technologies: Chlorine solutions (Piyush, Piyush+), water test kits, PA vial, body belt incubators, colloidal silver water filters, bio-sand filters.
- Design and deliver innovative water and sanitation systems: drinking water treatment, rain water harvesting, ground water recharge, waste water and fecal sludge management.
- Provide sustainable operation and maintenance services for water treatment, waste water treatment, rainwater harvesting and fecal sludge management systems.





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Kathmandu University
Office of the Vice Chancellor

Message from the Vice Chancellor

Kathmandu University has been a pioneering institution in advancing academic and research activities in the field of Environmental Science and Engineering. Our faculty, students and alumni have permeated into various national and international organizations and have helped make significant achievements to transform the field of environmental innovation and sustainability.

Let us celebrate our achievements and also reaffirm our commitment towards making a better world. The capacity and knowledge we have compels us to be morally more responsible to address the needs related to environment. Unlike other issues, environmental issues are deeply personal issues to us all. My memories of childhood and youth are full of engagements with nature and the environment, most of which are in dilapidated conditions now. I feel sorry for the generation of today that is deprived of the basic provision of clean air to breathe, potable water to drink, safe rivers to swim, and clear grounds to play.

Leo Tolstoy rightly said, **'One of the conditions of happiness is that the link between man and nature shall not be broken'**. I am confident that this outstanding team is making 'Pratibimba', true to its name, a reflection of our commitment to utilize our knowledge and skills for improving the status of this planet and thereby to the lives of all. I assure of full personal and institutional support to the noble works you all are doing.

Prof. Dr. Ram Kantha Makaju Shrestha
Vice Chancellor

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Kathmandu University
Office of the Registrar

Message from the Registrar

As a human being, we belong both to the Nature as well as Society, I believe this was the essence behind establishing the Nature and Social Concern Society (NSCS), an initiative taken by the students of the Department of Environmental Science and Engineering, where any human being can play active role as a member. This is an interdisciplinary club, releasing an annual magazine '*Pratibimba*' on the occasion of World Environment Day 2019, covering ideas from across a wide range of topics related to environment.

I am glad that the members of NSCS are continuing the tradition that their seniors have passed on to them, unlocking their hidden treasure, as a result of which "*Pratibimba*" is now released in this beautiful shape and size. NSCS members have proven that education is not just going to class and getting a degree at the end. It's also about unveiling the talents and widening the knowledge and skills on you expressed in this form. The future belongs to those who believe in their skills, not degrees or grades!

The environment today is rapidly changing, and the only thing we can say with certain is that something uncertain is going to happen. In the world of such uncertainties, it is the duty of the Environmentalist to keep the Society informed about the adverse consequences. "*Pratibimba*" is a milestone that marks the growth, unfolds our imagination, and gives life to the imagination of the students of Kathmandu University.

I congratulate the entire Editorial team for their hard work and dedication that has resulted in the publication of this magazine.

Prof. Subodh Sharma, Dr.nat.techn.
Registrar

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Kathmandu University
School of Science

May 19, 2019

MESSAGE FROM THE DEAN

It is my pleasure to write this letter of congratulations to the Department of Environmental Science & Engineering (**DESE**), KU School of Science and the Nature and Social Concern Society (**NSCS**), a student club of this department who are publishing the annual magazine ***Pratibimba*** including inspirational and motivational as well as student's university real life experiences related articles. The word ***Pratibimba*** is a Sanskrit word derived from '**Prati**' & "**Bimba**" meaning a reflection, a mirror image. I am confident that this magazine would be informative and a guidance to prospective students.

The Environmental Science is an interdisciplinary field that studies environmental systems concerning about "how" and "why". Environmental scientists ask question about pollution, climate change, human population number, natural resources and so forth. The environmental science has immense and lucrative scope in current scenario. With the increase in importance of environment among people nationally and internationally, the job horizon of environment science graduates have also increased. The undergraduates in the environmental science can get jobs in various environment related organizations, NGO/INGO's and government sectors working in the field of environment. One can work as well as enjoy the fantasy of nature simultaneously.

At the Department of Environmental Science & Engineering, our students are the most important natural resources that we have. Our outstanding faculty members work hard preparing students for the future which may bring further changes to the practice of environmental science. Thus, we are proud of the friendly relationships that students build with the faculty and staff.

Moreover, the Department of Environmental Science & Engineering has developed an outstanding national and international reputation for academic and research activities.

I may take this opportunity to state that KU has been the pioneer in commencing undergraduate program in Environmental Science in Nepal keeping in mind that Nepal is in need of competent human resource to deal with community.

I hope that the department will continue achieving its mission with disciplined students, dedicated teachers and cooperative staff and finally to strengthen the status of our school. I would like to congratulate the ***Pratibimba*** team for their hard work and dedication.

I wish all the best for the future endeavor.

Prof. Dr. Kanhaiya Jha
Dean

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Message from the Head of the Department

We live in an environment that reflects our own actions. Having entered the new geological age of Anthropocene, our relation with the environment is of paramount interest to everyone on Earth. Our generation has witnessed some significant responses from the environment to our activities such as climate change and loss of biodiversity. Science has overwhelmingly established the fact that the human-induced catastrophes have increased in a rapid pace. It not only forebodes of an unbalanced Earth system but also challenges our generation to ensure a sustainable environment for posterity. Hence, to dwell upon and reflect on the influence of the human activities on the environment, Nature and Social Concern Society (NSCS), one of our departmental clubs, is bringing this Pratibimba magazine with great enthusiasm. I am confident that this endeavor will bear its fruits in the form of more vigilant people and the society. I also expect that this publication will enhance our quest for sustainable development with a solid understanding of its scientific bases. Hence, I wholeheartedly congratulate the team of Pratibimba for this praiseworthy effort.

Warm regards,
Kundan Lal Shrestha, Ph.D. Engg.
Acting Head
Department of Environmental Science and Engineering

Congratulations

Thank you for allowing me to write a few words for the Nature and Social Concern Society's (NSCS) first magazine publication "Pratibimba"- nature reflects our nature. I would like to congratulate the entire team of editors, writers, and all the contributors of the magazine's first publication. It requires sheer hard work, perseverance, and determination that helped the magazine reach this success. It indeed requires unique talent and dedication for such kind of creative exertion. As an alumnus (Environmental Science), it is a matter of great pride to receive a message from the publication committee to write a few words in their very first annual magazine. I vividly remember the NSCS establishment and our table display with some flyers and brochures about NSCS on the graduation day in front of the library building with several faculties and friends. After all these years (almost two decades), I am happy to hear that NSCS is still involved in many creative activities.

With this note, I would like to congratulate the entire team one more time for this grand success and may this Pratibimba reach great heights the years to come.

"प्रतिबिम्ब - अरु बर्षौ बर्ष प्रतिबिम्बित हुदै जावोस, मेरो लाखौ लाख शुभकामना"

Thank you,
Rajan Rijal, Ph.D.
B.Sc. (2001) & M.Sc. (2003) - Kathmandu University
Ph.D. (2011) - University of North Texas, USA

Congratulations

It gives me an immense pleasure to learn that an inaugural issue of the 'Pratibimba- Nature reflects our nature', a dedicated annual magazine of the Nature and Social Concern Society (NSCS) is ready for publication. The Pratibimba has been an important addition to the rich heritage of the NSCS. I am certain that the Pratibimba will be an interesting and informative read.

I appreciate and applaud editorial team for being able to successfully materialize Pratibimba from concept to a reality. Undoubtedly, putting together a myriad of ideas and creation into such a wonderful magazine demands pure dedication and patience. The NSCS has been pivotal in promoting environmental stewardship not only to students in the Department of Environmental Science and Engineering but importantly across various departments at the Kathmandu University. Reflecting on my experience, I can attest that being actively involved in the NSCS played an important role in both my personal and professional growth.

I am assured that Pratibimba will be instrumental in furthering the reach of NSCS. I wish great success and continuation to the Pratibimba. Congratulations once again to the editorial team!

Ashish Bashyal
Co-Founder and Chief Conservation Officer
Biodiversity Conservancy Nepal
KU ES Batch: 2004-2008
Email: a.bashyal@bioconnepal.org
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Message from the Coordinator

It is really an honor and proud moment for me to be a part of Pratibimba, Volume 1. As this is the first issue of Pratibimba, my team and I are very excited for it. “Pratibimba”, an environmental magazine has helped students to showcase their talent in terms of academic projects, skills in photography, art, design, editing, marketing and more. I hope that this magazine will reflect many topics related to the environment as we have given our best to make it as informative as possible. We all know, the environment is something that is connected to everything in this world. The content of the magazine also tries to do the same as it contains articles from almost every field.

As a Coordinator, I would like to express my gratitude towards the department, NSCS, Kathmandu University, all the sponsors and especially my team members without whom the dream of the first Pratibimba would not have been possible.

Here’s to hoping that my juniors, as they set out on a four year journey at Kathmandu University, will discover their own passions, unearth their dreams, vanquish their fear, shape their ambitions and give continuity to Pratibimba. Here’s to looking forward to reading Pratibimba 2020 for which I wish everyone all best and also wish for their strength, courage and determination to reach their destination, and also for leaving behind stronger trails of Pratibimba for their juniors as well.
Cheers!

Sadip Raj Pandey
Coordinator
Pratibimba 2019

Message from the editorial board

We are delighted to present our readers the first edition of "PRATIBIMBA": Nature Reflects our Nature, the annual magazine of Environmental Science students at Kathmandu University. This magazine is a platform where not only the teachers, faculty members and students can express their ideas and views, but also anybody who feels connected with nature and the environment.

"Pratibimba" simply means 'Reflection'. The name of this magazine was chosen so to send out the message that nature, our home, is highly influenced by us inhabitants and also our 'human nature' itself. Nature reflects back what we do to it, be it sincere care, or a despicable act of degradation.

The magazine aspires to boost up environment issues through articles, artwork, photographs and so on. We hope to inspire and motivate people of all ages and disciplines into contributing their little but into increasing concerns about the environment. Through written words, we have done our best to reflect nature from the eyes of people. We hope to have created a platform that will help everyone channel their voice and to help the readers get inspired to contribute to a better and cleaner future.

The realization of this magazine has been made possible due to dedication of its hardworking team and more importantly the creative writers, photographers and artists. We take this opportunity to sincerely thank all the people who have generously contributed to the successful publication of this magazine and have motivated us throughout the process. We hope to give "PRATIBIMBA" continuation in the years to come and continue an effort to raise the much needed concerns about the environment.
Happy reading!

The Editorial Board 2019

PRATIBIMBA TEAM



SADIP RAJ PANDEY
MAGAZINE COORDINATOR



MARKETING TEAM



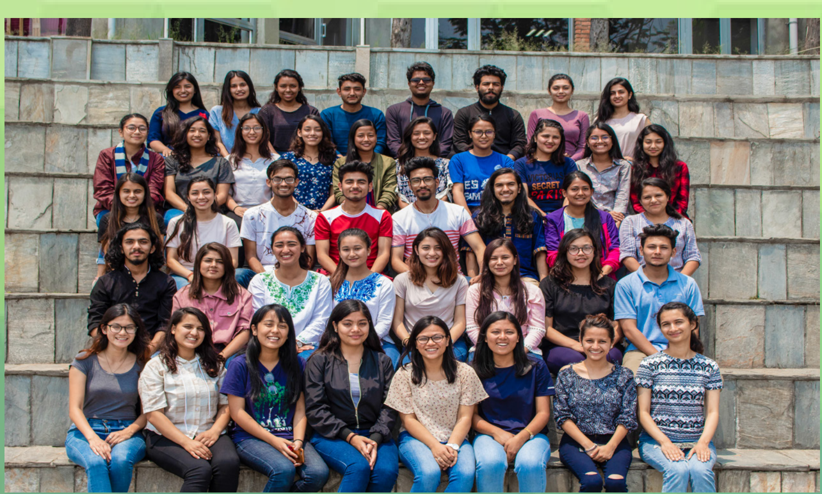
EDITORIAL TEAM



TYPING TEAM



DESIGNING TEAM



TEAM PRATIBIMBA



के नै फरक पर्थ्यो र !

सँगै उभिएका सहकर्मीले बढ्दै गएको भिडलाई देखाएर भने, “यो जमात अत्यन्तै स्वार्थी मानिसहरूको जमात हो । यिनीहरूले बुझून, सिकून, जीवन सपारून भनेर कति मिहेनत गरियो, घाँटी सुकाइयो, सकेजति गरियो । ऐले हेर्नुस् न, देखेर नि नदेखेझैँ गर्छन् मतलबीहरू” ।

सन्दर्भ थियो काठमाडौँ विश्वविद्यालयको दीक्षान्त समारोह सुरू हुनुअघिको चहलपहल। मङ्सिर अन्तिमको कलिलो चिसो विहानी घाममा अधिकांश परिचित स्नातकहरू मख्ख, गमक्क अनुहारमा आफ्ना फिँजिएका गाउनका फेरले हामीलाई छुँदै यताउता हिँडिरहेका थिए । मानौँ सबैको ध्यान सबैमा थियो। वा कसैलाई कसैको मतलब थिएन ।

यसभन्दा अघि कुनै उपाधीका लागि गाउन नलगाएकोले मेरो पनि विद्यार्थीको रूपमा जीवनको पहिलो दीक्षान्त समारोह थियो त्यो । म पनि त्यो दिनको विशेष पोशाकमा सजिएर केही सहकर्मीहरूको समूहमा उभिएको थिएँ, थोरै मख्ख धेरै खुसी।

सँगै उभिएका अर्का सहकर्मीले फरक मत राखे, “सबै उस्तै हुँदैनन्, वर्षौंपछि सम्झिएर भेट गर्न, सम्मान गर्न आउनेहरू पनि त हुन्छन् नि । यो पनि बुझौँ कि आजकलको गुरू-चेला सम्बन्ध समेत लेनदेनको सम्बन्ध जस्तै भइसकेको छ, अत्यन्त औपचारिक । समयले मागे अनुसार । अझ भनौँ कथाले मागे अनुसार”।

“हो लगभग त्यस्तै,” मैले आफ्नो भनाइ राखेँ, “बिल्कुल लेनदेन, औपचारिक । शिक्षकको जीवनमा खातका खात नयाँ मानिसहरू आउँछन्, अनि पुराना जान्छन् । आएका मध्ये केही प्रतिशत सम्झनामा रहन्छन्, र केहीले सम्झिन्छन् । सबै सम्बन्धहरू सम्हाल्न र तिनलाई न्याय दिन शायद हामी पनि नसकुँला । यसरी पनि हेरौँ न, उसबेला तपाईँको वरपर रहने, तपाईँलाई गाँजेर वा तपाईँबाट भागेर दुःख दिने त्यो ब्याकुल र काँतर प्राणी अहिले हुर्किएको छ, स्वाधीन भएको छ । तपाईँले पनि भन्नुभएको थियो होला – आँटी बन्, गरीखाने बन्, अहिलेकै तालले हो भने घरको न घाटको इन्जिनियर बन्लास् । ऊ त्यही बनेको छ, आँटी, ज्ञानी र गरीखाने इन्जिनियर । यसमा अलिकति भए पनि तपाईँको पनि देन छ भन्नेमा सन्तुष्टि लिनुस् ।
अब लेनदेन सकेपछिको सम्बन्धलाई कसरी सम्हाल्ने भन्ने उसले सिकेकै छैन भनेर चित्त बुझाऔँ न”।

यो गन्थन गरिरहेको भए लम्बिन्थ्यो होला, लम्बियो पनि होला । मलाई त्यो दिनको स्नातकको रूपमा मात्र गफिएर समय काट्ने अधिकार थिएन । म त शिक्षक नै थिएँ, दीक्षान्त गाउनले केही अंशमात्र छोपिएको । आफ्नो जिम्मामा केही काम थियो । साथमा थिए कार्यक्रमको वर्णन गर्न तयार बसेका भविष्यमा हुनेवाला वैज्ञानिक र इन्जिनियरहरू ।

केही समयपछि म डिग्री थापेर आफ्नो नाम लेखेको कुर्सीमा हलचल नगरी बसेको थिएँ । दायाँबायाँबाट विभिन्न विधा र तहका स्नातकहरू अगाडि बढिरहेका थिए । म लाइन, भिड, बूढा, तन्नेरी, क्यामेरा, लाउडस्पिकर, हाइहुइ र आधा दर्जन अरू फ्याक्टरहरूले गाँजिएको थिएँ । उठेर हिडौँ त सबैभन्दा अगाडि बसेको उपल्लो तहको स्नातक । बसौँ त भिड र धुलोले निल्ला कि जस्तो अवस्था । यत्तिकैमा दायाँपट्टिको लाइनबाट कसैले कोट्यायो । म फर्कें । एउटा हँसिलो अनुहारले हात लम्काएर भन्यो, “वधाइ छ”। हात मिलाउँदै धन्यवाद दिएँ । फेरि अर्कोले त्यसै गर्‍यो । मैले पनि हार्दिकताका साथ धन्यवाद साथै वधाइ दिएँ।

मैले पहिलो व्यक्तिलाई केहीबेर पछिमात्र चिनेँ । लाममा पर पुगेर पनि ऊ मलाई हेरिरहेको थियो । शायद महसुस गर्‍यो क्यारे मैले चिनिनँ भनेर । दोश्रोलाई त देख्नेबित्तिकै चिनेँ । ती दुबै थिए कम्तीमा दसवर्षअघि एक सेमेष्टर पढाएका विद्यार्थीहरू ।

ती दुईबाहेक डिग्री थाप्न मञ्चमा पुगेका दर्जनौँ अनुहारहरूले मतिर हेरेर मुस्काउन छुटाएका थिएनन् । मेरो नाम पढिँदा र म मञ्चमा चढ्दा केहीले पछाडिबाट हुइया गर्न पनि भ्याएका थिए ।

आफ्नो खुसीको त्यो क्षणमा केही समय पढाएको शिक्षकको खुसी पनि सम्झिन भ्याउनेहरू आम स्नातकहरूभन्दा फरक नै थिए जस्तो लाग्छ ।
हो नि, सबैले कहाँ माया मार्छन्, वा वेवास्ता गर्छन र ।
तर नचिने नदेखेको भए नि, नहाँसे नबोलेकै भए नि के नै फरक पर्थ्यो र !

डा. हेमराज काफ्ले

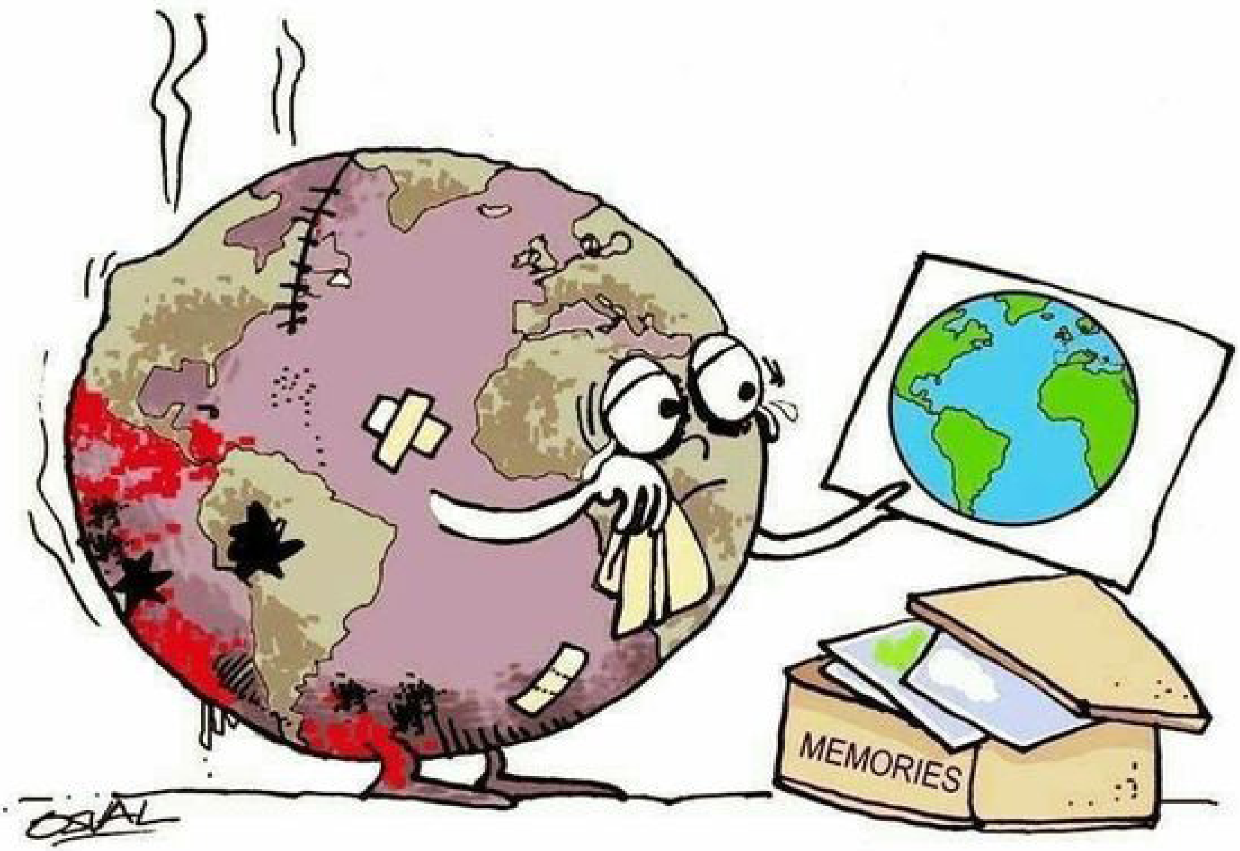
Foreword

As a result of tremendous and collective effort of the NSCS family, a magazine dedicated to the Environment is now in the pipeline of publication. As the name sounds, “Pratibimba” is a shining ray, a milestone in the Environmental concerns and issues. What could be greater news than this for an environmentalist?

Being a social animal, it is our prime and moral obligation to safeguard our environment and nature. Moreover, as environmentalists, we have specific duties and responsibilities in more ethical ways to sustain the Eco-system. They examine the relation between human beings to nature or our natural environment; account our overall understandings of nature, realization of invaluable resources that we’ve retrieved from it and our efforts in conservation and protection of Mother Nature.
With the publication of first ever Environmental Dictionary, “Dictionary of Environment, Vol: 1” to this magazine, “Pratibimba”, we have put in all knowledge and efforts to ensure that the planet does not lack good work.

At this moment, I take on the opportunity to extend my sincere gratitude and convey my heartfelt wishes to the publication of this magazine. How lucky I am to keep my forewords on this wonderful piece of work. Best wishes!

Kshitiz Kandel
President, NSCS (2016-1017)



Nature and Social Concern Society



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Message from the President



A century ago we didn't have all these technologies we use today. It was a whole different world, but to the e earth, a hundred years is just a cipher. Even a million years is nothing. This planet lives on gigantic scale we cannot even imagine. We can't describe how diverse the services of this beautiful planet is and we haven't got the audacity to conserve it. We've been here for a second and if we're gone tomorrow, the earth will not even miss us. Earth is what we have taken from the future generation on loan and everything we and do to exploit is what we and our future generation will have to pay to repair it.We, the students of one of the most reputed institutions feel that this plight of the environment needs to get to the larger audiences and it is exactly what Nature and Social Concern Society (NSCS) was, is and will always be focused on.

I still remember “name of the magazine (if we are going to publish one)” was what everyone talking about when we were discussing the idea of the annual magazine. After a few days with lots of ideas we all agreed that “Pratibimba” is what we are going to publish, “Pratibimba” is what will reflect the true image of what we have done to nature. Writing as the President of this club I would like to express my gratitude towardsthe family of the first edition of Pratibimba for making this possible as this is one of the finestinitiatives in the history of NSCS. As knowledge grows on sharing, Pratibimba will grow as it shares and aware people of their duty towards the home we live in. My best wishes and once again kudos to the team of this amazing magazine.

HEALTHY TRANSITIONS

"You are part of one of the best institutions of the country. Now be prepared for hundreds of tests in coming days"

That was my first day in Kathmandu University (KU) in August 2005 when our then School of Science Dean, Dr. Pushpa Raj Acharya informed us about the examination system in KU during the orientation class. After hearing this statement, I became doubtful about surviving the undergraduate years in KU. The undergraduate years, especially the first year was indeed demanding and stressful. Being a student of environmental science, I was unable to understand the logic behind taking completely different classes such as engineering drawing and computer programming which I perceived were irrelevant in the environmental sector. Yet, as I look back, I have realized that those classes helped us gain basic knowledge in different fields and encouraged us to increase our engagement in interdisciplinary areas.

Enduring the first year in KU could be challenging for many students. Transitioning from easy-going high school atmosphere to hectic college environment may not be a piece of cakewalk. Additionally, the sense of individual identity and new found freedom in college might confuse young adults. No matter how difficult everything appears, most students gradually adapt to the university environment and learn to deal with difficult situations.

Studying in KU is not only about exams and grades. It is the place where you learn social skills, make memories, meet and work with diverse individuals, understand your life goals and more importantly recognize your own values and potentials. Most of us were so concerned about getting higher grades that we failed to experience and participate in constructive fun-filled activities of the university. That I see as a missed opportunity of life. Working hard and achieving good grades is definitely the main objective of studying in university but students need not worry about scoring higher grades all the time. After working professionally for years, I have learned that grades alone do not define the value of an individual. What matters are your skills, your passions towards your work, goodwill and openness and the way you deal with others.

Graduation is undoubtedly the biggest achievement in the students' life. However, real life starts after you graduate from university. Some of you might start job hunting and some will apply for higher studies. Your time in the college and experiences with friends appear like a distant memories. This is also the phase where you will experience the next transition of your life leading to certain anxiety and feeling of uncertainty. Do not be disheartened if things do not move according to your plan and be prepared for failure as well. We have all been through it, survived it, acknowledged the reality and moved forward to achieve our mission.

Here are some of the tips that may be useful in your transition into more focused individual:

• Recognize your passion and interest and invest time to research on your interest.
• Never compare your situation and growth with your friends and colleagues as we all have our own individual journey.
• Participate in club activities, conference, seminars, sports and cultural programs where you get the opportunity to network with different people and learn from them.
• Improve your reading, writing and public speaking skills as such skills hold significance in every field.
• Regularly contribute your article to national dailies and magazines based on your learning and ideas. If it gets published, it motivates you to write more on various issues, sharpen your knowledge and analytical abilities and even helps you get noticed by the readers.
• Learn to ask questions, express yourself and take part in dialogue/debate without the fear of being

judged.

• Maintain healthy and respectful relationship with people that you meet in all walks of life.

• Explore and try for internship and short-term volunteer work during your semester breaks as such experiences will help you understand organizational functioning and paves the way for the next step in your career.

• Apply for relevant training and short course to enhance your capacity in particular field.

• Never give up and believe in yourself. Do not be afraid to experiment and break stereotypes.

In conclusion, I would like to say that student life in college is one of the most significant parts of our lives when we start to explore our identity and gain new experiences. Since it is also the journey to our adulthood, one need to learn to think rationally, take responsibilities for the actions and work towards shaping the future well being.

Anustha Shrestha
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Importance of Conservation Education

Growing up in the countryside, I spent my childhood collecting firewood and grasses, listening to the songs of birds and wallowing on the grassland. I was profoundly attached to nature and realized the intimate relationship of humankind with it, which aspired me to work for its conservation. Travelling to different parts of the country and working with different communities, I delved into the life of the rural people and realized that biodiversity is closely linked with the livelihood and well-being of the local community. However, people are unaware of the importance of forests, wild animals, and other natural resources. Furthermore, over the past few years, Nepal has experienced devastating climatic and non-climatic hazards thus threatening biodiversity and wellbeing of humankind. In addition, Nepal has become the easiest route for smuggling wildlife parts to Tibet and people that are arrested for smuggling frequently make the coverage. It shows that people are oblivious about the importance of conservation, which strongly suggests a need for creating awareness from the grassroots level, work for educating children and youth today, so they could turn into individual conservationists in near future.

Conservation Education is vital to tackle the environmental issues today. We know that today's children are tomorrow's conservation leaders. However, today's children are not as connected with nature as previous generations. If people do not have a connection to nature, they do not realize its value or feel a sense of responsibility for it and are less likely to take action to save it. I believe that every person should have regular opportunities to connect with nature, so they value it, and take action to save it. If a child's everyday activities directly or indirectly connect with nature, the more manageable will be their symbols. It is thus important to urge children and youth to understand and conserve nature and wildlife. Everyone should learn the role of each plant and animal in the ecosystem and discern the significance of its existence.

Educating our children today to be a responsible citizen to conserve the nature is one of the most important works any of us can do for future generations. Creating awareness by visiting youth clubs, schools, and colleges and encourage

teachers and students to integrate conservation education activities in school curriculum should be done. In addition, it is necessary to engage students in practical aspects of conservation by communicating in-house and outreach conservation programs as follows.

Jungle walks: Calculate the velocity of walk, identifying trees, taught the importance of plants, and identifying butterflies. Children will touch, taste, and smell herbs and fruits, listen to the sounds of streams and the songs of birds. They will engage in physical activities like running across meadows, jump on the grasses, hide beyond the trees, collect the leaf litters, and soon.

- Bird watching: Taught to use binoculars, identifying birds, listening to the bird calls, identifying their salient features.
- Zoo visit: Identifying animals and their behavior, being encouraged to take photographs, and asking each student to write what they have learned during their visit.
- Encouraging students to start eco clubs in schools.
- Encouraging them to minimize the use of plastic bags.
- Celebrating wildlife weeks and conservation days: Conduct painting and speech competition.
- Making bird houses and feeding birds at schools.
- Encouraging them to plant trees at school and home.

However, in Nepal it is challenging to demand conservation education in school curriculum as this concept is new and no school and colleges have prioritized conservation education till date. Therefore, it is necessary to develop suitable conservation education curriculum in supplement with the school courses.

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Beauty!

If you think beauty doesn't matter then why is it that a moth is swatted but a butterfly is adored?
Is it not the plainness of the moth and the appeal of the butterfly that makes the difference?

If you think beauty doesn't matter then why is it that the stripes of a tiger draw in hundred and thousands of donations whereas endangered frogs and tarantulas go unappreciated?
Are they any less important?
If you think beauty doesn't matter then why is it that the green spaces are filled with orangutans, rhinos and leopards whereas nobody talks about giant golden mole, blob fish and slugs?
Is it not that they are less welcomed by viewers?

If you think beauty doesn't matter then why is it that the visually appealing creatures are given their own title as "charismatic faunas" whereas the ugly ones are not even acknowledged?
Is it that the creatures that are not alluring useless?

If you think beauty doesn't matter then just have a look around you,member all your visits to the zoo, then maybe reality will come to you.
Maybe then you'll realize that not all are born to be cute pandas but some serve the purpose of an odd looking aye-aye too.

Smritee Subedi
B.Sc. Environmental Science
2nd year (Batch-2017)

Oceans

The ocean has forever been a symbol of abundance. This endless ocean knows no limits. The only limit it is familiar with is the imagined end you create in your mind which is merely just a mirage in your head. This provides a reassuring feeling that even though our eyes perceive the end to be near, our heart believes there is no ending. Lines like "you are the ocean of beauty" were perhaps created for ocean's resemblance of beauty, love, adventure and freedom".

The ocean is a magnificent body that soothes me like no other. The quivering maneuver during the silent dark hours and the serene agility during the sunshine hours easily complement to its contrasting beauty. I feel most at peace when I find myself in its vicinity. The ocean always gives me a warm feeling; the feeling a mother gets when she sees her son returning home after his first day of school or the feeling the same child has when he meets his mom after spending a whole day without her in an unusual school environment. The feeling is strong from both sides and it gets amplified with a warm tight hug.

Free, adventurous, giant, placid and at times at the antonyms of such words, the ocean's mysterious beauty is irresistible. My natural inclination to this described beauty roots to me being a water sign, giving me a feeling of home; warm and secure. Hence, I can forever muse in its symphony and retreat in its ambience.

However, a dismay to all this is the crisis we are facing today which is ironic because this substantial crisis is what we led ourselves into. I, and so many other earthly beings take so much pleasure in myriads of ways just by wandering by the ocean. Therefore, it's high time we thought about the harm that we have been causing to the environment or else ocean's beauty to the generations to come might as well just be an imaginary story written by writers like us.

Pallavi Pokharel
B.Sc. Environmental Science
3rd year (Batch-2016)

The great hornbill



Source:https://www.thainationalparks.com/img/species/2013/12/30/7982/great-hornbill-800x600.jpg

The great hornbill (*Bucerous bicornis*) also known as the great Indian hornbill is one of the larger member of the hornbill family. The most prominent feature of the hornbill is the bright yellow and black casque on top of its massive bill which has made it important in many tribal culture and rituals. The casque is hollow and serves no known purpose but is believed to be the result of sexual selection. Being the largest member of hornbill family, its body size ranges from 95-130 cm long with 152 cm wingspan and a weight of 2.154 -4 kg .The great hornbills are found in the forest of Bhutan, Nepal, Mainland South-East Asia, Indonesian island of Sumatra and North eastern region of India. Their distribution extends into Thailand, Burma, Malaya, Sumatra and small feral population of Singapore.

This bird is enlisted as vulnerable A3cd+4cd by IUCN redlist category. It is listed in Appendix I of CITES. In the context of Nepal ,National park and wildlife conservation act 1973 also lists this bird as a protected bird of Nepal. The estimated hornbill population is <500 in Nepal. The current population trend is decreasing and latest survey shows 13000-27000 numbers of mature individuals globally. This species frequent wet evergreen and mixed deciduous forests correlated with density of large tree required for nesting. Some nest trees include *Tetrameles nudiflora, Dipterocarpus gracilis, Cleistocalyx nervosum, Shorea faguetiana, Hopea odorata, Neobalanocarpys heimii, Mangifera indica* e.t.c.Great hornbills diet consist mainly of fruits rich in lipid of *Lauracea* and *Myristicacea* families. They obtain required water from their diet of fruits. These species also take eggs, amphibian, reptiles, insects etc. Due to its attractive body feature, hunting poses a substantial threat to the species. Its predictable behavior and regular visit to the same feeding sites is easily targeted by poachers. This species is highly prized for its fat which can be used in various purposes including medical treatment to gunpolish. A survey in north eastern India found that the species is mainly hunted for food as well as casque which is used as adornments by local communities. A casque can fetch up to $90 in northeast India. Loss of mature trees with cavities and scarcity of fruiting trees and other food items have added additional threat to the species. Some other threats include residential and commercial development, logging, wood harvesting, and pet trade.



Some underway conservation action includes captive breeding in zoos, hornbill nest adoption programs are implemented in Budo Sungai-Padi National Park of Thailand and Pakke Tiger Reserve in Arunachal Pradesh. Hornbill festival is also celebrated in Nagaland as the Festival is named after the hornbill, the globally respected bird and which is displayed in folklore in most of the state's tribes shows cultural importance in conservation. Nest monitoring and protection program is underway in Kerala. Some of the proposed conservation actions include site/area protection, population trend research, systematic monitoring and increasing awareness which also plays major role in conservations action. Jari, a captive hornbill in Jurong Bird Park,Singapore was fitted a prosthetic 3D printed bill after surgery to remove cancerous tissue shows great step towards conservation.

Pratik Baral
B.Sc.Environmental Science
3rd year (Batch-2016)

EPIC BAGS NEPAL









Every species of Cannabis is not harmful...

Cannabis sativa, the first impression everyone is getting from this heading and these species is "Marijauna" or "Ganja". Many of the readers have already made a mind that this article as a strong supporting article for the use of these narcotics. We still need to think twice before speaking about this species in the public as we fear of the judgment of the third person walking around. But are every species of *Cannabis Sativa* family that harmful??

We are too good at generalizing things. In this practice of generalizing things, there is a species of C. sativa family that is stuck inside the government rules and regulation of getting banned, although it has a lot of positive impacts to provide to the society. The name of the species is Hemp, a species of family C. sativa that is banned here in Nepal as per government rules and regulations.

Firstly, let us generally go through their distinctive features:
Starting from the anatomy, Marijuana features broad leaves, dense buds and has a short, bushy appearance while Hemp features skinny leaves that are concentrated towards the top of the plant and grows taller and skinner than Marijauna, with few branches beneath the upper portion.

Talking about the composition, both of these contain Tetrahydrocannabinol (THC) that induces psychoactive effects (what we call getting high) and Cannabiodiol (CBD). But on comparing, Hemp contains only 0.3% of THC in contrast to 15%-40% in Marijauna which is why Marijauna is used for recreational purpose and hemp for the industrial purposes.

This is how we can differentiate hemp from Marijauna but what has hemp to offer to human day-to-day living for which it needs to be legalized in Nepal? As being a mountainous country, the quality of the hemp produced in Nepal is considered best of its type all around the world. There are a lot that hemp has to offer to us.



Source:https://lh3.googleusercontent.com/cGUUs08xTzh99YHvXSWaJR4midE-

Some of the uses of the hemp are:
Hemp Fibers: The fibers obtained from hemp generate best quality clothes and garments that have an increasing market day by day.
Textiles: Hemp textiles are economically viable and also more durable than the cements and other textiles.
Medicine: Different proven Medicine are extracted from the root of this species
Oil/Flour/Bakery and Beer: The seed of this species can be used for the producing flour, oil also bakery items and beer.
Fuel: Recently, it is also proven that fuel can be extracted from the seed of this plant
.
Thus, jumping under the conclusion, it is very important to impose governmental action on this species as this species has a lot to offer for the economical prosperity of developing country like Nepal. Controlled and regulated government policy towards this species has a positive outcome that suppresses the so called negative part of Cannabis Sativa family.

Raize Adhikari
B.Sc. Environmental Science
4th Year (Batch-2015)

Green Concrete

Concrete is the second most consumed material in this world. Concrete consists of fine aggregates (sand) and coarse aggregates (rocks, gravels) bonded together by cement which hardens over time giving strength to the composite structure. It was first used around 700 BC by Nabatean traders who discovered the properties of hydraulic lime with self-cementing properties. After that, it wasn't used much until the 18th century when British Engineer John Smeaton built Smeaton Tower using concrete. Since then, its use skyrocketed up to the point that it became the second most consumed material after water in this world.

It is used practically in every structure mainly because of properties like workability, high compressive strength and tensile strength (only when coupled with steel reinforcements), fire resistance which makes it useful in making houses, buildings, dams, monuments, etc. It is estimated that around 10 billion tons of concrete is produced annually.

Although concrete is vital to physical infrastructure and overall development of human beings, it has also harmful effects on the environment that need to be addressed. Concrete needs cement and it is estimated that the cement industry ALONE contributes to a whopping 8% all worldwide $C0_2$ emissions. Nearly 900 kg of CO_2 are emitted for every 1000 kg of Portland cement produced. Besides this, cement industries also emit heavy metals into the air which can cause severe health problems and air pollution.

Besides cement, concrete damages the most fertile layer of the earth, the topsoil by creating hard surfaces which leads to surface runoff, soil erosion, water pollution and flooding. It also causes urban heat island effect, which is the case when urban areas become warmer compared to surrounding rural areas.

When it comes to producing environmentally friendly concrete, the major aims are to reduce CO_2 emissions, usage of fossil fuels during production, usage of harmful mixtures in the concrete, savings in use of cement through substitution by other materials, and recycling concrete/ cement.

Green Concrete is environment friendly concrete which improves three pillars of sustainability: environmental, economic and social. The key factors that are used to identify if concrete is green are amount of portland cement replacement materials, manufacturing process and methods, performance and life cycle sustainability impacts. This can be done with the help of nanoengineering.
For example, concrete's strength and durability lies in the organization of spherical nanoparticles, calcium silicate, which when stacked in pyramids reaches a high density. If we can find particles other than calcium silicate hydrates that will pack in high densities without the burning, that's quite the invention. Some have identified that magnesium could be an alternative to calcium silicate hydrates.

Reduction of energy during cement production is one of the ways to make concrete greener. For example, Utilization of inorganic polymers (geopolymers) in sustainable concrete is one method which has smaller CO_2 emissions compared to Portland Cement. Similarly, Urban waste (municipal solid waste) can be used for the manufacture of concrete. They relate to the utilization of waste in a sustainable manner and can reduce CO_2 emissions.

Despite different methods developed in the field of green concrete usage, green concrete faces barriers like construction business practice, unwillingness of consumers, building codes, lack of a holistic approach in engineering education and research, etc. However, if our resources are to be conserved and used sustainably, conventional concrete should be considerably reduced and use of green concrete should be strived towards for.

Sushant Dahal
B.E Civil,
3rd Year(Batch-2016)

Woolly Mammoth Revival: Obligation or Obnoxiousness





"Now, the question is – is it an obligation to revive the woolly mammoths or is it yet another obnoxious activity of the brilliant Homo sapiens?"

The charismatic beasts, Woolly mammoth which once ruled the tundra region of Alaska, Canada and Siberia known as "Mammoth Steppe" during the Pleistocene epoch vanished at last from the Wrangle Island located in the Arctic Ocean. No mortal knows exactly how they were wiped out. However, scientists have speculated that they must have been edged to extinction either due to global warming or due to human hunting. With the advancement in genetic engineering, scientists are attempting to resurrect the long-gone gigantic mammals and they can succeed to some extent. Now, the question is – is it an obligation to revive the woolly mammoth or is it yet another obnoxious activity of the brilliant *Homo sapiens*?

With the question "Is this process of de-extinction necessary?" comes two facet analysis. In one hand, the woolly mammoths were responsible to maintain the grassland ecosystem in the Mammoth steppe during the Pleistocene epoch and also to prevent the melting away of the permafrost. Permafrost is the permanently frozen layer below the earth surface made up of soil, rock, sand and organic matters bound together by ice that is maintained at a temperature below 0°C for at least two consecutive years. Permafrost is believed to have trapped twice the carbon dioxide than that present in the atmosphere. Global warming has resulted in the thawing of the permafrost releasing the carbon dioxide to the atmosphere which in turn contributes to global warming creating a positive feedback loop. Woolly mammoths were responsible to trample the trees, mosses, and shrubs leading to the sustained grassland ecosystem. The grassland is efficient in reflecting back a large amount of the sunlight absorbing very less heat that prevents the thawing of the permafrost and hence prevents the release of the carbon dioxide. In this regard, it is obligatory to reintroduce the giant mammals for the sake of solving global warming.

While on the flip side, there is still a dilemma of whether or not they should be revived. Despite their ample benefits with regard to the solution of global warming, there arises a question – are they the only mammals that are responsible to solve the problems of global warming? They have been extinct for more than 10,000 years and within this period, the niche they had occupied for years could have been overcome by some other organism. By now, we are adapted to living without the Woolly mammoth. Even if there has been no other solution yet, better solutions can be fetched. Instead of re-introducing these behemoths, smaller mammals such as bison and horses can be organized.

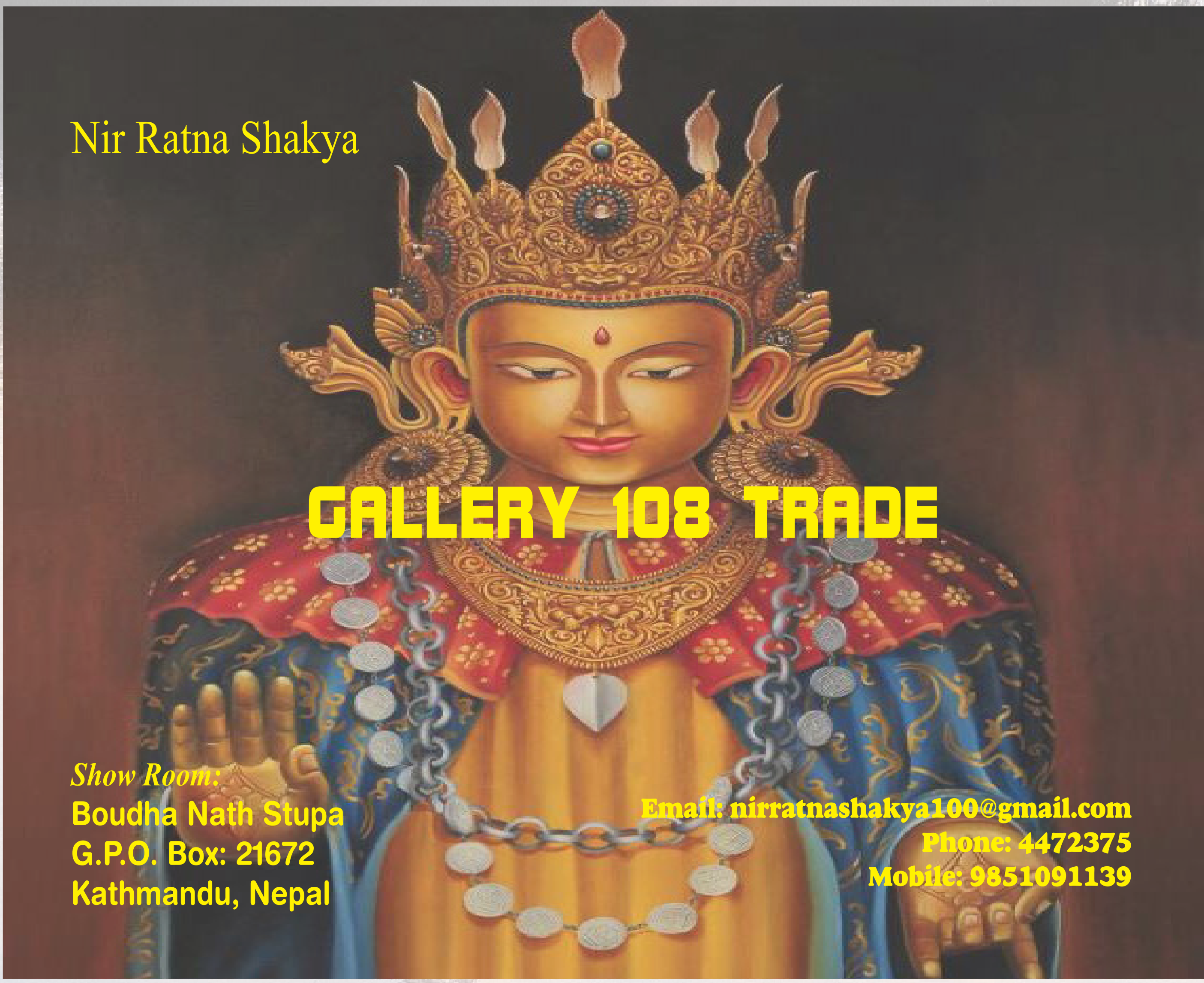
There is no question about "How?" but about "Should?" The advancement in Genetic Engineering has been culminating. There is no doubt that even the woolly mammoths can be revived.

But still – “Should they be resurrected?” What about the habitat, food and other resources that will be required to sustain them? With their disappearance from the earth, all the factors that supported their survival have changed with time. What use will it be if the mammoths are revived but there is no supporting environment for their sustenance?

A Russian Scientist Sergey Zimov and his son Nikita Zimov have been painstakingly studying about resurrecting Woolly mammoths. They have established a Pleistocene Park in Northeastern Siberia and attempting to rewild the Arctic, home for Woolly mammoths. Their motive is to save the planet and the mortals. But when the Polar Bears are at the verge of extinction, Tigers are threatened, Rhino is facing a terrible crisis and many other existing animals are at greater risk, is it wise in part of a human to go after the long-gone creatures? Are we not supposed to preserve the existing creatures over the extinct ones?

And this question is still haunting – “Is it an obligation to revive the woolly mammoths or is it yet another obnoxious activity of the brilliant *Homo sapiens*?”

Prakriti Kandel
B.Tech. Biotechnology
4th Year (Batch-2015)



The air in Kathmandu University: Is it affected by transported polluted air from Kathmandu Valley?

"As alumni of the Department of Environmental Science and Engineering, Kathmandu University, I feel honored to get this opportunity to congratulate the new young members of Nature and Social Concern Society (NSCS). I would also like to congratulate the team for the new idea of publishing environmental magazine "Pratibimba: nature reflects our nature". I hope that this initiative will help to generate new ideas among environmentalist and publish newly updated research progresses in the field of environmental science and technology."

This World Environment Day, June, 5th 2019, has one of the most important theme "Air Pollution" saying we cannot stop breathing, but we can do something about the quality of air that we breathe. Many scientific studies on air pollution in the Kathmandu valley have shown serious air pollution hazards with very high concentrations of toxic chemicals in the air. In my opinion as a researcher and some of the findings from our work, we found that Kathmandu University (KU), Dhulikhel, is not safe from air pollutants transported from the valley especially during the dry periods (pre-monsoon) (Fig. 1). We initiated air pollution monitoring based on a collection of Total Suspended Particulates (TSP) samples for a year from (January to December 2018) in collaboration with Dr. Kundan Shrestha (DESE, School of Science, KU) and his master's student. Several chemicals were analyzed from the sampled filters, and the results made me surprised to see the high concentrations of those pollutants in the KU atmosphere. Mercury one of the most toxic element and is regarded as the global pollutant was found to be seriously higher during the dry periods (except monsoon) and correlated well with TSP mass and the carbonaceous components such as Organic carbon, Black carbon and the total carbon in the KU sir in 2018. We analyzed particulate bound mercury (HgP) from the TSP samples. The HgP and TSP mass have a clear seasonal variation with significantly decreased concentrations during monsoon (June-September) and higher during the dry periods, see Fig. 1.

Furthermore, our results showed significant correlations with TSP, HgP and PM2.5 from Kathmandu and Kathmandu University air sampled on the same days during the pre-monsoon period Fig. 2, suggesting that the pollutants from Kath-



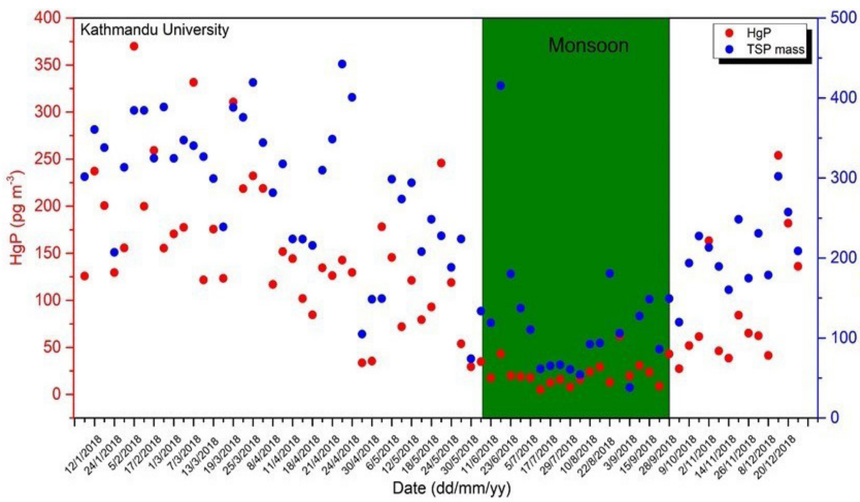


Fig. 1. TSP sampling and daily variation of HgP and TSP mass in Kathmandu University

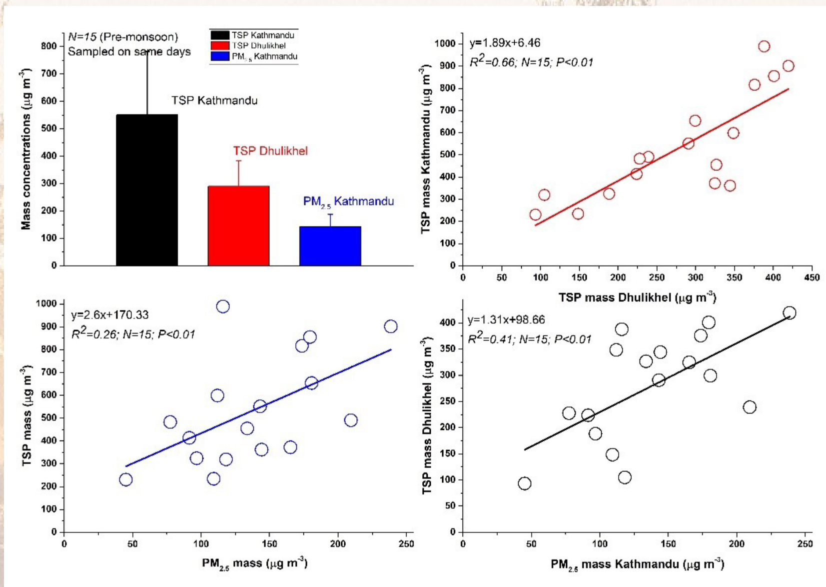


Fig. 2. Total suspended particulates (TSP) and PM2.5 in Kathmandu and Dhulikhel and their associations during the pre-monsoon period

mandu must have reached the KU site during that period. This needs further confirmation by analyzing different wind fields, meteorological observations, satellite and modelling of air over the sites. This does not mean the total contribution of air pollution in KU is from Kathmandu; there are various local emissions over the surrounding areas, such as pollution from waste burning, brick kilns and pollutants emitted from traffic from Banepa. However, this study paves a way forward for air pollution in the region and confirms KU atmosphere is not safe from pollution from the highly polluted capital valley. Moreover, good associations among HgP concentrations at Kathmandu and KU site further suggested the transport of particulate mercury from Kathmandu to Dhulikhel (Tripathee et al., 2019, in preparation). This is a preliminary finding from one-year observations of aerosols over the middle hill site in Nepal, which needs wide dissemination among environmental professionals, students, policymakers as well as the local public. The increasing air pollution over the region has great impact on the health of the human being as well as the whole ecosystems. The atmospheric pollution could also impact on the aquatic, terrestrial and the Cryospheric environment of our frazil Himalayas, as it could be long-range transported and deposited via wet/dry deposition. Furthermore, black carbon aerosols deposited on the glacier surface can decrease the albedo and enhance glacier melting. Therefore, KU as one of the best Universities in Nepal should perform the researches on such critical issues of air pollution and impacts on the Himalayan environment and the ecosystems.

Therefore, in my opinion, there is a need for continuous long-term sampling and observation of aerosols in order to understand: the concentrations, seasonality and transport mechanisms of air pollution in KU, Dhulikhel. In addition, there is a need for spatial studies as the air quality is variable due to its complex geography and meteorology of the region. Since air pollution is the hot topic in our region due to its severe health impacts; I feel the department of environmental science and engineering and clubs like NSCS should give importance to atmospheric research and formulate research-based recommendations to improve the atmospheric environment of the University as well as the whole nations. Moreover, long-term spatial and temporal investigation of air pollution and their sources can be helpful to formulate new policies and acts to reduce pollution and to understand the trans-boundary air pollution and implement mitigation strategies. I am very hopeful that KU, DESE will think about such serious environmental issues and start new studies on these topics in the future. I am grateful to share findings on air quality from the University I graduated. I would also like to thank Dr. Kundan Lal Shrestha and his student Kundan Yadav for their support on aerosol sampling in the University and the head of the department of DESE, Prof. Bibhuti Ranjan Jha for the support for this project.

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High altitude lakes as indicators of environmental changes: a palaeolimnological perspective

Lakes located above treeline are called high altitude lakes. These lakes are characterized by a set of unique physico-chemical and biological features which set them apart from other waterbodies. They are often located in small catchments with slow weathering bedrock; and characterized by a thin topsoil layer supporting sparse vegetation, short ice free period, high UV penetration. Accordingly, these water bodies often tend to have low conductivity values, low nutrient concentrations and dissolved organic carbon; with short food chains. They provide a range of crucial ecosystem services for local as well as downstream communities. Because of their remoteness, high altitude lakes are less affected by local sources of pollution and thus these ecosystems are often used as reference sites to evaluate changes elsewhere and many studies have emphasized their importance as sensors of global environmental changes. Moreover, their bottom sediment deposited over time stores important information of the past environmental conditions. These information are present in the form of fossilized diatom valves, chironomid mouth parts, pollens, chrysophycean starch, Cladocera; organic matter content, isotopes and geochemistry. These components act as proxies of lake and catchment history and thus can be used to reconstruct long as well as short-term past environmental conditions and associated environmental changes in Palaeolimnological studies. Paleolimnological studies involve extraction of lake bottom sediment cores, slicing of the cores into sub-samples, establishment of sediment chronology and analyses of physical, chemical and biological proxies in the sediment cores to infer past environmental changes. A number of such studies have been carried out in lakes worldwide to quantity the observed changes in pH, organic pollutant contamination, nutrient concentrations, fluctuations in lake water levels. Such information are essential not only for past environmental reconstruction of lakes and their catchments but also for defining reference conditions of the lakes; current status and trends of environmental changes; identifying the causes of such changes in defining restoration targets thereby helping in developing future strategies for proper lake and watershed management.

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Forest soils are important sinks for methane, but can human use of forests reduce their efficiency?

Forest soils are known to act as sinks for atmospheric methane, a major greenhouse gas. Methane is the most abundant organic trace gas in the atmosphere, primarily created by biological processes of microbes (methanogenesis). It plays an important role in global climate change, and forest soils are known to be effective sinks for methane. In soils, methane is primarily utilized by bacteria that oxidize it to produce carbon. However, the effectiveness of soils as sinks is affected by land-use practices such as agriculture, and forest or woodland soils are considered more effective sinks than soils in human landscapes. Forests are increasingly affected by anthropogenic influences such as animal grazing, forest fires, etc. by the people living in the vicinity of the sanctuary. Treading and trampling by grazing animals leads to soil compaction, especially in wet tropical conditions. Soil compaction decreases the number of soil pores, in turn decreasing soil aeration. The condition of reduced soil pore volume and increased water-filled pore space reduces the ability of soils to absorb methane.

During the monsoon, grazing activities are lower due to heavy and prolonged rainfall, which will lead to higher methane sink. While higher grazing pressure during the post-monsoon season leads to reduced methane sink. While human practices are known to play a role in altering forest sink potentials, disturbances due to animal grazing can also reduce soil's methane oxidation potential, hence reducing the overall methane sink strengths of soils in forestland

Nani Raut, Ph.D, Assistant Professor
Department of Environmental Science and Engineering

The Himalayan Covenant

It all started on a late November afternoon when I was about six years old. I could find myself tiptoeing on a wooden plank to level against my terrace pane. Balancing my 4 feet stature, I finally rested my fragile arms on the cemented wall. My wrinkled forehead came to ease as I transfixed my gaze towards the crystal-clear transcendence of the Himalayan range that stretched northeast of Kathmandu. It was love at first sight. Seventeen years later when I visit the same spot now, it is more of a disappointment. The picturesque mountain range can be compared to a blurry shot from an old camera.

My budding affinity towards the mountains augmented over time, and during my final semester, I got the opportunity to conduct research among them. The project was titled the 'Study of physicochemical parameters of meltwater draining from Ponkar glacier, Manang' and it was funded by the University Grants Commission, Nepal. This would not only serve as my final semester thesis but also provided me a chance to step into the majestic realm of the Himalayas.

The trails that seemed definitive during the first hours of the trek slowly started disappearing as we ascended. I found solace in the wilderness, chirping birds and the sound of the river alongside. The last hurdle of the journey presented itself in the form of a ridge. When I reached the top, I was overwhelmed by the beauty of two contrasting views – on one side was a lush hill with blooming flowers and on the other was a sparsely vegetated valley immersed in fog and snow. The glacier-fed rivers appealed to me at the very first instance as they made dendritic pattern downstream. I was awestruck by the Himalayan streams, its flow rate, whitish appearance and all the secrets it carried down to the hills and southern plains. It was there on the edge of the ridge that I was struck by a moment of epiphany. I was bombarded by emotions in the company of sheer silence, heavy breathing and the burning blisters on my toes.

The misty Ponkar valley had me stumped from the very first sight. We stayed at a hotel that was at the farthest edge of the valley. The mules ran free and there was a heavy downpour in the likes of rain and snow within a span of 5 hours every day. I separated the seven sampling stations to be covered in the next three days that ranged from a high altitudinal glacier lake to the terminus of the glacier. They covered an altitudinal variation from 3500 m to almost 4100 m above sea level.

The study primarily focused on utilizing the physical parameters (Temperature, Conductivity, pH) and chemical processes to narrow down the prevalence of cations, anions and trace metals in the study area and its relationship with the bedrock geology. I found out that the calcium carbonate weathering played a pivotal role in the dominance of calcium and bicarbonate as the major cation and anion respectively. Hence, we came to an important conclusion that the bedrock geology in the Himalayan region is calcareous

.

We often fail to discern the importance of glaciers and tend to overlook the importance of mountain hydrology. The Intergovernmental Panel on Climate Change estimates that around the world, glaciers (excluding the Greenland and Antarctic ice sheets) will decrease in volume between 15 to 55 percent by 2100 even if we are able to limit global warming to under 2˚C; they could shrink up to 85 percent if warming increases at a higher rate. Glacier represents the snow of centuries and more than one-sixth of the world population live in the basins of glacier-fed rivers. In total, 1.5 billion people – a fifth of the world's population - depend on the Himalayan rivers for their water supply. In the context of Nepal, three large major river systems: Karnali, Koshi, and Gandaki originate from the glaciers and snow-fed lakes. Therefore, it is absolutely crucial to address its significance in our daily lives as we depend on it so much. Once the glaciers in the Himalayas start retreating, there is no way it can be restored (Until Earth experiences another Ice Age, and do you think it is happening anytime soon?), and we will have to look for alternative primary sources for freshwater to live off our days.

So, now that the adversities of climate change have dawned upon us, it is imperative to become a changemaker in this domain. I vow to protect the glaciers and water resources at all costs, and I hope you will too.

Kripa Rajyashree Thapa
BSc. Environmental Science(Honours)
Batch: 2013-2017

THE MOON AND THE MADNESS

"It is the very error of the moon
She comes more near the earth
Than she was wont
And makes men mad"

-William Shakespeare (Othello)

Unlike other planets, Earth has got only one permanent satellite i.e. Moon which makes it very special. Not only for Earth but also for the inhabitants of the earth, this astronomical body is most special after the Sun. Moon is also taken as a sign of beauty that's why various songs and poetries have been written and sung using Moon as a metaphor for the beautiful face girls possess ("Yeh chand sa roshan chehra").

Since moon revolves around the earth in an elliptical path so there comes a point when the moon is closest to earth called Perigee and also point farthest called Apogee. If full moon coincides with the Perigee then moon appears bigger and brighter called Super Full Moon while on Apogee it is Mini Moon. Interesting, isn't it? So how much do you observe the moon in your daily life? Can you believe it has influence over you and on your mental health to a certain extent?

According to Universal law of gravitation "Every particle attracts every other particle in the universe with a force which is directly proportional to the product of their masses and inversely proportional to the square of the distance between their centers", which means every object that you can think of with real mass and around you is affecting you with its gravitational force and so are you. Similarly, the gravitational force of the moon is also acting upon every material on the earth, this also results in the rising of tides in water bodies. This tidal effect of the moon is greatest during the full moon. As you already know, that human body is 70-80% of water, don't you think the moon also has an impact on your body during this phase? According to Greek Philosopher Aristotle and Roman historian Pliny the Elder brain was the moistest organ in the human body hence mostly affected during the full moon. "There must be a full moon out there" phrase has been used over decades by people while explaining the unusual and weird behavior at night. The word lunatic popularly used during late 1800s which means mad was derived from the word "lunaticus" which means "of the moon" or Moonstruck. "Lunar lunacy effect" or "Transylvania effect" is popular in Europe which is believed to mainly persist during the Middle Ages, when human being transformed into Werewolves and Vampires during the Full moon.

Not only in the past but still people believe that during full moon all the strange activities like erratic behaviors, fights, suicides, traffic accidents, psychiatric patients getting out of control, etc. A survey revealed 45% of college student believed moon struck humans are prone to strange behavior, in fact, this belief has been held by mental health professional more than laypeople. Amazingly, in 2007, the police department of the U.K. added more officers to control the presumed crimes during a full moon night.

According to a research done by the University of Basel on the effect of the full moon, they concluded the significant impact of the full moon on sleep quota of individuals taking more time to sleep, decrease in the time of sleep, additionally participants showed decreased level of serotonin, which regulates the sleep and wake up cycle. So, after reading this, I hope you somehow start to believe that the moon has significant effect on mental health but it's good to be a skeptic than to have blind faith so I recommend you to mark the next full moon day on your calendar and observe yourself, your behaviors, feelings, etc. and if by chance you find yourself creeping by negative emotions like stress, anger or anxiety take a deep breath and embrace those feelings. Accept the fact that like the Moon, we too go through phases, it is part of our life. Peace!

Prayon Joshi
B.Sc. Environmental Science
4th Year (Batch-2015)

A Letter to Mother Nature

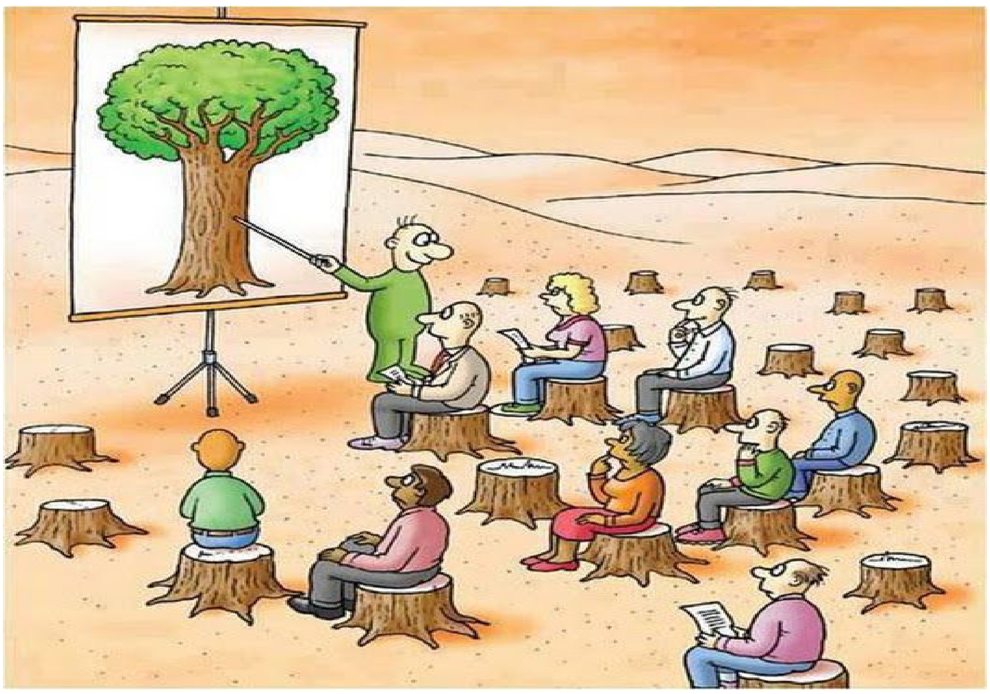
Dear Nature,

Hello from this side. I hope you are well (though I don't have the right to ask after what we humans have done to you but couldn't hold myself without asking). I want to tell you a little secret; when I was small I used to feel you on my every breath, I used to water you every morning, I used to feel the warmth of your rays but now I just smell carbon, water plastics and get burned every time I try to feel you. Can I ask you a question? Are you angry with me? Have you stopped loving me? I just know one thing that I have never stopped being in love with you.

I know you too have a lot of questions and an honest answer to it is, I want to slide in your lap and have a peaceful nap forgetting whatever has happened between us. You know I love being with you more than I love being with humans. And believe me or not every time you were torn I felt the pain and when you were burned I was scathed too. I can feel, hear your joy with the whistle you blow through the wind (you know it's the best way, didn't you?). You were the only one that stayed with me through my whole journey, when I was happy when I was angry and even when I was sad. I know I haven't done enough to deserve you but don't you think everyone should get a second chance? So, today, I want to thank you for being there, just not for me, but for everybody, for giving us our lives (even though we don't deserve it after what we have done and have been doing to you) and blessing us with a beautiful place to live.

Today, I bind myself with you by promising you that I will forever and ever be loyal to you. No matter how many crisis, ups and downs we will have I promise to hold our relationship for centuries. My dear friend it's time to say goodbye (though bidding goodbye is not my favorite part), will be catching up with you tomorrow. See you in the first sunrise of every morning.

Your stupid little Human
Anusha K.C
B.Sc. Environmental Science
2nd year (Batch-2017)



A letter to Mother Earth

Dear Mother Earth,

Really, I have been so lucky to walk and stand being by your greenery, just so I can glimpse the infinite moments of water, and watch the glorious sun set and rise each day. It has been an honor to watch your mountains, hills, and travel by water, air, car, and foot. Thank you for allowing me to build and raise my family on you. Thank you letting me run naked and roll on the grass with a lover and whisper sweet nothings in the mornings with sunrise and enjoy the light of moon in the evening. Thank you for allowing the children to play and laugh on you. Thank you for the sky with its clouds, sun, birds, and all its beautiful colors. Thank you for showing me that life has seasons, change, the great surrounding to express my joyfulness and sadness that is natural itself by birth. Thank you for the depths of the ocean and how it reminds me of the depth of this soul which I long to connect with every day.

Thank you, Mother, for giving me a chance to taste all the different fruits, vegetables and feeding all of us and not judging any of us. Thank you for allowing us the freedom to be ourselves and for providing the variety of trees, plants, and animals. So many varieties of life you nurture freely and lovingly. Thank you for not judging us, when we judge and take from you. We don't mean it, we are just lost in our minds and we are scared to change, love, and wake up. We want to please each other so much but we fail to acknowledge our own love and beauty first. We are a selfish lot. We don't care to nurture ourselves, change, and go with the flow. We don't want to look at you sometimes and appreciate you because it reminds us that we are scared to look at ourselves. Your climate changing due to us is not something we can sit back and watch any longer. You have given us a home. You have fed, clothed and cared for us - you meet our every need. But people still want more, and your resources are not endless. Now, more than ever, we need to band together and act towards protecting your future, and our own.

We are sorry for taking advantage of you. Waging wars on you. Competing, comparing, taking, stealing, killing, murdering, and hating on you. We are. We are just flat out scared to look at you, Mother. You continue to show us unconditional love and forgiveness. And yet, we don't learn. We drill for oil, but we don't look to the sun for life and energy. We are greedy and want more. As your children we are sorry. We are scared, frightened, and tormented by a story of the past, of guilt, of shame, of many things. We are scared to wake up. We are selfish beyond belief. Our beliefs are selfish, and our stories continue to create death and destruction and yet we fail to understand that we are life itself. We are sorry our technology has excluded the presence of you from our life.

Why can't we, your children think of a better day to clean up or care for you rather than World Environment Day, June 5. Can't we take care of you as we do ourselves as well as our family or friends? It must be tiring. Because you are our Mother. You have nurtured, loved us, cared for us, and we don't care. We want more, more, more, and we live in a world of quicker service and yet we are more distant than ever. I write to apologize for taking you for granted. Not listening to you, not caring for you, not praying for you, and not loving you. For you keep showing up and we keep hiding, running, and waging war on you. We will learn, or we will lose you.

Thank you. As we wake up to the heart, we got a chance to see you and enjoy the whole life with you. But right now, we are children who have forgotten to be childlike. Thankful and so sorry for our actions. I know you forgive us, but know we are asking to be forgiven as well, for we acknowledge our wrongs.

One day I will lay down on your feet, and allow you to love me more and more. There I will be reminded that I am safe, cared for, and loved.

One of your children,
Ashish Lamichhane
B.Sc. Environmental Science, Amrit Science Campus(ASCOL)
2nd Year



THE WORLD IS DYING

We Are Drowning In Plastic

Worldwide, about 2 million plastic bags are used every minute. This might seem like an unbelievable number but according to Ecowatch, between 500 billion and 1 trillion plastic bags are used worldwide annually. With the largest population, China produced the largest quantity, nearly 60 million tonnes. China was followed by The United States at 38 million tonnes, Germany at 14.5 million tones and Brazil at 12 million tonnes.

According to The United Nations, ingestion of plastic kills an estimated 1 million marine birds and 100,000 marine animals each year. Additionally, more than 90% of all birds and fishes are believed to have plastic particles broken up into tiny sizes in the ocean and consumed by these fishes, birds and aquatic life forms. Research conducted by Plymouth University suggests that close to 700 species of marine life are facing extinction due to the increase in plastic pollution.

Everybody uses plastics; things made up of plastics as well as the things wrapped up in plastic. There are many types of plastic and they are all light and low cost and can be used in all weather. And they last long, really long. But the funny thing is we don't usually use plastic that long. We throw away plastic cups, bottles, chips, wrappers, straws, etc. and that too immediately after their single use. Plastics are made up of chemicals that don't easily decompose. If anything, plastics take a really long time to degrade and within that time it causes a lot of damage. These things have led to a high prominence of plastic pollution in the environment. Plastic pollution can afflict land, waterways, and oceans. It is estimated that 1.1 to 8.8 million metric tons of plastic waste enter the ocean from the coastal community each year. Living organisms, especially marine animals are harmed by this be it mechanical effects such as entanglement in plastics, or through exposure to chemicals, or ingestion of plastics. Humans are also affected by plastic pollution such as disruption of the hormonal mechanism.

Plastics themselves contribute to approximately 10% of discarded waste. Many kinds of plastics exist depending on their precursors and the method of their polymerization. Recent studies have shown that plastics in the ocean decompose faster than was once through, due to exposure to sun, rain and other environmental conditions, resulting in the release of toxic chemicals such as bisphenol A. However, due to the increased volume of plastics in the ocean, decomposition has slowed down. It is estimated that the decomposition of a foam plastic cup will take 50 years, a plastic beverage holder will take 400 years, a disposable nappy will take 450 years and a fishing line will take 600 years. Plastic pollution has been described as being highly detrimental to large marine mammals. Some marine species such as sea turtles have been found to contain large proportions of plastics in their stomach. When this occurs, the animal typically starves because the plastic blocks the animal's digestive tract. Sometimes, marine animals get trapped in plastics and nets and die there.

Chlorinated plastic can release harmful chemicals into the surrounding soil which can then seep into groundwater or surrounding water sources and also the ecosystem. This can cause serious harm to the species that drink the water. Landfill areas contain microorganisms, nylon-eating bacteria, and flavor bacteria. These bacteria break down nylon through the activity of the nylonase enzyme. Breakdown of biodegradable plastics releases methane, a very powerful greenhouse gas that contributes significantly to global warming.

What can you do to end plastic pollution?

- Reduce your use of single-use plastics.
- Make sure to recycle plastic.
- Participating in or organizing a cleanup of your local beach or waterway.
- Avoid products containing microbeads.

Prabesh Baniya
B.Pharmacy
1st year (Batch-2018)

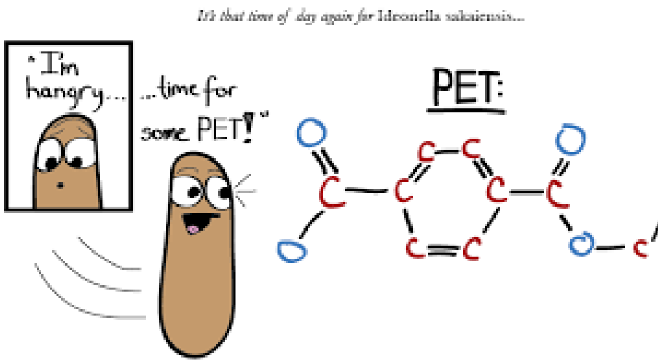


Can plastics be degraded ?

My hands are on the keypad of my laptop and I am typing by pressing those small keys and I am aware that I am using a device with many parts of it made by Plastics. Plastic mostly related to words like Pliable (Stretchable, malleable) and Polymers (of many parts) has become an indispensable part of our life. It is used in each part with which we strike time and again in our daily life. Annually we manufacture about 3 million ton of plastics. Looking at the statistics of 2017, world plastics production totaled around 348 million metric tons and the rate of manufacture is growing exponentially. The plastics (Focusing; Polyethylene terephthalate (PET)) comes with the packaging of clothes, utensils, mineral water, drinks, other devices (laptop, pen, watches, etc.) and vast use in scientific discovery and other technical fields. These products are most essential for us so we can agree that the plastics are used for the vital works but what about the work done by the plastics towards the environment?

In a cycle of nature everything dies, deteriorates once to keep up the balance but what about plastics? Are Plastics that idiosyncratic stuff that violates this very ethic and lasts forever in the environment? The answer was yes before 2012 and was only believed to maintained by following 5R principles (Reduce, Reprocess, Reuse, Recycle, Recover) but by 2012 a group of Student from Yale University searched for plants within the Amazon and then cultured the microorganisms within the plant tissues and ended up by finding pestalotiopsis, which could effectively degrade polyurethane(used mostly in hard plastics and foam) and again in 2016 a team at Kyoto University had found a bacterium that degrades and assimilates poly(ethylene terephthalate)(General plastic bottles). By scrambling around sediments, soil, wastewater and other piles of wastes they took 250 samples in 5 years and isolated a bacteria "Ideonella Sakiensis" that can live on Plastics. The second discovery of 2016 was more effective in comparison with the first one as Ideonella Sakiensis could grow easily but it is not that easy to cultivate fungi pestalotiopsis. The student of Kyoto also identified the enzymes that are used by sakiensis to breakdown the PET. They identified a gene in the DNA of bacteria that is responsible for the production of PET degrading enzyme. The enzyme was named as PETase. The PETase can breakdown certain chemical bonds in PET, leaving tiny molecules that can be absorbed by bacteria using carbon in them as a food source. Different groups of people of many countries like Korea, China, UK, and Brazil are in continuous research to find out the mechanisms of the enzyme and trying to make it work faster by manipulating its active parts. This is unusual that the enzyme that is being discovered should work faster than the natural one. But still, this achievement shows that these bacteria are recently evolved to survive on the man-made plastic which can be an evolutionary approach to engineer an optimized form of PETase. Despite the negative impact of plastics we mostly depend on Plastics and if the rate of enzyme formation increases then the durability of plastic products decreases.

What if the bacteria started eating all the plastic structures of the environment in an uncontrolled way that were made to last for the number of years? Will our survival become possible without any plastic products? The situation can arise as we are not that good to outplay with bacteria. (Antibiotics example). But perhaps looking at today's worst condition of Environment made by plastics, the identification of bacteria like Ideonella sakiensis can be a good fortune for all the living creatures.



Samyog Dhakal
B.Sc.Environmental Science
2nd Year (Batch-2017)

Plastic Ban: Toxic Fumes Reduction

Burning plastic smells awful, which is no surprise when you know that plastic is basically made of oil and gives off toxic fumes when it burns.

Incineration of plastic waste in open fields is a major source of air pollution. About 12 percent of most municipal solid waste is made up of plastic of one kind or another, and 40 percent of the world's garbage is burned, according to the study "Toxic Pollutants from Plastic Waste – A Review." The plastic bag bans recently announced by Tanzania and Zambia, which follow effective bans in Kenya and Rwanda, are good news in terms of air pollution, given that much of Africa's waste ends up in flames.

The burning of plastics releases toxic gases like dioxins, furans, mercury and polychlorinated bi-phenyls (better known as BCPs) into the atmosphere, and poses a threat to vegetation, and human and animal health. Dioxins settle on crops and in our waterways where they eventually enter our food and hence our bodies. These dioxins are potentially lethal persistent organic pollutants that can cause cancer and disrupt thyroid and respiratory systems. Phthalates, the very chemicals that give plastic their desirable qualities—flexibility and softness—are endocrine disruptors, associated with a plethora of health problems, from fertility issues and neonatal impacts on babies to allergies and asthma.

Burning of plastic waste increase the risk of heart disease, aggravates respiratory ailments such as asthma and emphysema and cause rashes, nausea or headaches, and damages the nervous system. Burning plastic also releases black carbon (soot), which contributes to climate change and air pollution.

It really doesn't make sense to manufacture products whose value is measured in minutes and which persist for an eternity without degrading. We are killing the planet with our greed to make a profit without care. Burning plastic contributes a lot to air pollution and people living near dumpsites and those working there are at great risk of developing respiratory diseases and cancer.
In March 2019, the United Nations Environment Assembly passed a resolution entitled Addressing single-use plastic products pollution. The resolution encourages governments and the private sector to "promote the more resource-efficient design, production, use and sound management of plastics across their life cycle". Around the world, efforts are being made to reduce the amount of plastic waste that ends up in landfills or in our oceans. For instance, in March 2019, the European Union approved a law to ban many single-use plastic items, such as plastic cutlery, single-use plastic plates, plastic straws, and plastic balloon sticks, from 2021.

Everybody should support for waste minimization and be ready to take comprehensive action, in regard to single-use plastic products, to address the waste through, where appropriate, legislation, implementation of international agreements, and improvement of waste management practices".
"The quality of the air we breathe depends on the lifestyle choices we make every day"

Hirendra Bista
B.Sc Environmental Science
2nd Year (Batch -2017)

Plastic



Source:https://i1.wp.com/www.cleanfairfax.org/wp-content/uploads/2018/03/plaststykker_i_haand2.jpg?resize=600%2C288&ssl=1

"Microplastics in the sea now outnumber stars in our galaxy."

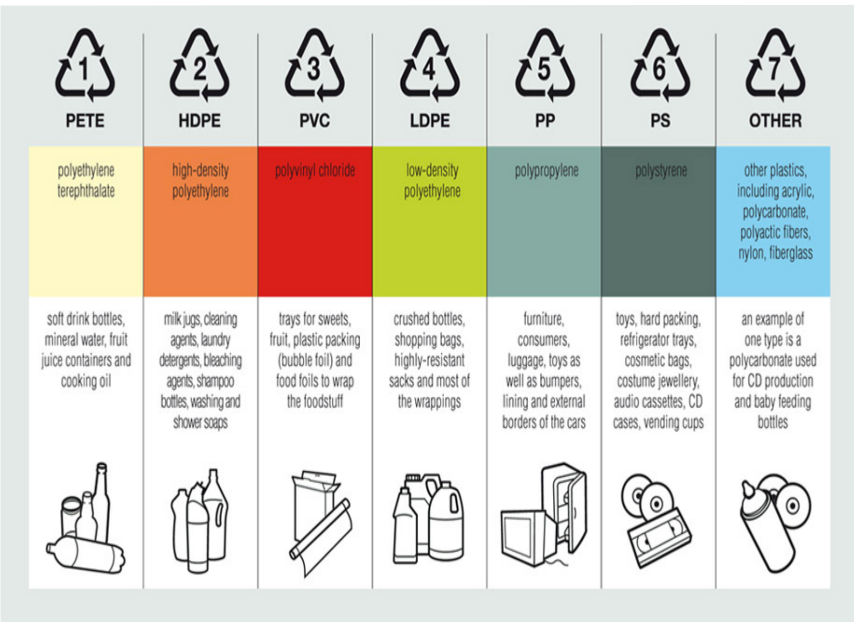
This was the motivation behind the theme of the 2018 World Environment Day. If this isn't a statement that makes you think about what humans are doing wrong, then we're not the smart ones on this planet.

Plastic, something that we use daily and has become a part of our lives, is a necessary evil. More than 50% of the things that we use daily, are made of different kinds of plastic. Starting from single use plastic bags, to computer parts, and the glasses that help most of us see.

The problem doesn't only lie in plastic products. Most of the blame is on humans. We, as responsible inhabitants of Earth, should have an obligation towards managing the plastic waste we produce. This means, being accountable for every piece of straw you use, every plastic bag you throw away, every bottle you drink out of, and every single wrapper that doesn't make it to the dustbin. There are hundreds of recycling plants everywhere that can convert your plastic waste into new products. New technologies are available that can produce energy out of the huge amount of plastic waste.

There are endless possibilities, one need only be ready to take a step for the planet.

Rashmi Singh
B.Sc Environmental Science
3rd Year (Batch 2016)



Source:http://www.slowfoodbarbados.org/slowfood2016/wp-content/uploads/2018/05/SPI-Resin-identification-codes.jpg

खै

खै म यस्लाइ के भनौं
कतै कालोपत्रे बाटो त कतै २५०० हेक्टरको बिमानस्थल
कतै आफ्नो अस्तित्व गुमाएको माटो त कतै
मानवले प्रक्रितिलाइ गरेको त्यो छल
खै म यसलाइ के भनौं !
मानिसको पुरा नहुने रहर
कि अज्ञात वस्तुमा खुसि खोज्ने एक् पहल

कतै धुलो र धुंवाको भुमरिमा रुमल्लिएका जनता त
कतै कुर्सिकालागि लडिरहेका ति राष्ट्रवादि नेता
कतै लाखौंको भिडमा हराएको मौनता त
कतै जिवन प्रतिको त्यो निरथक्कता
खै कस्लाइ र कसरि बुझांउ यो जिवन र धर्ति बिचको संम्लग्नता

कतै कालो धुंवाको मसाल निस्किएको कालकार्खाना त
कतै प्रक्रितिलाइ कैद गर्ने ति झ्यालखाना;
कतै मानिसको नजरमा रहेको जिवनरुप् खेलौना त
कतै ति साना-चराचुरुङ्गिको बिलौना;
खै म यस्लै के भनुं, मानवको पुरा नहुने चाहना
या अज्ञात वस्तुमा खुसि खोज्ने उस्को अनगिन्ति बहाना

Sarana Tuladhar
B.Sc. Environmental Science
2nd year (Batch 2017)

52-Hertz

"In the underwater world dominated by sound lives the loneliest whale with an unusual vocalization". 52-hertz whale is an individual whale which calls at an unusual frequency of 52 Hz. Due to its unique sonic frequency, it appears to have gotten less or no response from other whales be it blue or fin whales. Blue whales usually call at the frequency of 15-20 Hz while fin whales vocalize at 20 Hz. As the pitch of 52 Hz whale is much higher than the frequency to which whales respond to, it seems to have received no company despite calling out thereby earning the nickname of "The Loneliest Whale".

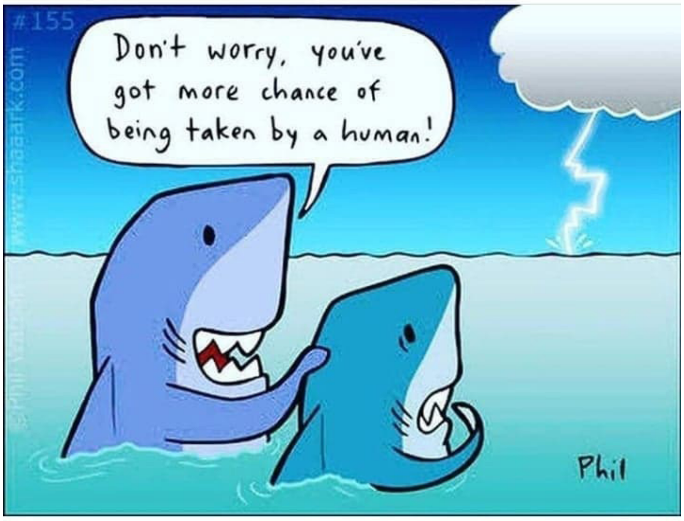
This unusual frequency was first discovered by William Watkins, one of the pioneers in the field of marine mammal bioacoustics in the North Pacific in 1989. Despite receiving the signal of a whale travelling in the same way and the area of blue and fin whales, the vocalization was of rather high pitch which roused interest in the Watkins. Thus, William Watkins and his team recorded the whale yearly for about 14 years, each time picking the signal in August or September and following it until, it swam out of range in January or early February. The findings were published in the Journal Deep Sea Research in 2004.

Surprisingly, the study was picked up by the general media and this quickly caught attention of the public. Humans were wondering and relating empathetically that if the whale was communicating at a different frequency than others of its kind then would it ever receive any response. Soon the 52 Hz whale became a symbol and metaphor of loneliness and 'unheardness' to which many people appeared to identify themselves with. The story of 52 Hz whale certainly got people emotional thinking about the whale crying out in a massive space but getting no response from the void.

Upon researchers unravelling the story, some believe that whale's singing has features similar to that of a blue whale and that all the whale can usually hear it. By 2015, the vocalization of the 52 Hz whale had deepened as humans' do and it sounded close to 46 Hz. No sighting of the whale has been recorded till now. Even though unusual frequency might cause difficulties in communication, it is indeed getting harder for the whales' call to be heard above the noise caused by human activities such as oil and gas exploration, degrading and shipping traffic.

The 52 Hz whale has given a story to the lonely and unheard ones out there. It has been a namesake for some foundations which have reached out to help others. While this empathetic and caring nature of human beings, one can hope that people will soon realize that they are in fact causing many species to be lonely through their materialistic ways. Extinction rate now has been estimated to be 1000 to 10,000 times the natural background rate. We have to protect the species for balanced and sustaining biosphere.

Shraddha Kunwar
B.Sc. Environment Science
2nd year (Batch-2017)





The time is not now, the time was yesterday

Before you turn the page and neglect this article, let me tell you something. Did you know that each year, about seven million premature deaths occur due to air pollution? Nearly 90 per cent of these deaths occur in low- and middle- income countries (LMICs). Air pollution is the biggest environmental health threat, being the culprit behind 1 in 8 deaths around the world.

Air pollution and climate change are closely interlinked. The energy, transport, industry, agriculture, waste management and land use sectors emit the majority of greenhouse gases. These sectors are also the main sources of fine particulate matter (PM2.5), and short-lived climate pollutants like black carbon and ground-level ozone. PM2.5 particles penetrate deep into lung passageways when inhaled and can cross into the bloodstream to cause serious heart diseases and respiratory effects. Noncommunicable diseases such as stroke, cancer and heart disease are the leading cause of death in the world. After tobacco, air pollution is the greatest cause of noncommunicable diseases.

Ambient air pollution was responsible for an estimated 4.2 million premature deaths in 2016. The WHO air quality guideline for PM2.5 is a value of 10 micrograms per cubic meter as an annual mean concentration of ambient air. Globally, 93% of all children live in environments with air pollution levels exceeding the WHO guidelines. In Nepal, the annual mean concentrations in urban areas is around 75.69 micrograms per meter cube, one of the worsts in the world.

For about half of humanity, access to hot meals, light, and warm shelter is one electrical switch away. But for the remaining 3 billion and more who depend on burning wood, dung, coal and other polluting fuels to meet their daily needs, the resulting smoke is a major health threat. Exposure to smoke produced by cooking fires kills 3.8 million people each year. Women, owing to their greater involvement in daily cooking and other domestic activities, are at a higher risk. The work done in order to survive is in turn impacting their health. In Nepal, 74 per cent of the households are primarily dependent on polluting fuels. Clean household energy is thus necessary to reduce the heavy burden of diseases.

In the First Global Conference on Air Pollution and Health which took place at the WHO Headquarters in Geneva from 30 October to 1 November 2018, a goal of reducing the number of deaths due to air pollution by two thirds by 2030 has been targeted. The enormity of the problem is real, and it is what should drive us to fix it. We need to breathe life back into our cities, and if you ask “when’s the time to do so?” That time was yesterday.

Bisrantee Wagle
B.Sc. Environment Science
3rd year (Batch-2016)

Amazing Facts about Albatrosses



Source:https://cf.ydcdn.net/latest/images/main/A5wanderingalbatross.jpg

1. Albatrosses are massive seabirds that belong to the ***Diomedeidae*** biological family.
2. They spend 80% of their entire life at sea, visiting land only when they have to breed.
3. They can live up to 60 years, depending on what species they are.
4. Most albatrosses are found in the southern Hemisphere, in places like Antarctica, Australia, South Africa and South America. However, there are three albatross species are found only in the north Pacific, such as Hawaii, Japan, California and Alaska.
5. The oldest recorded albatross is a Laysan albatross called Wisdom. She was found in 1956 as a mature adult and hatched another chick in February, 2017, which makes her at least 66 years old.
6. The wandering albatross has the longest wingspan of any other birds. It ranges from 2.51 meters to 3.5

meters, or 8 foot 3 inches to 11 feet 6 inches.
7. They can drink sea water.
8. They are colonial, which means that they nest on remote oceanic islands, far away from human civilization.
9. Albatross pairs bond over several years and use ritualized dances to get acquainted with one another. Their bond will last the pair for the rest of their life.
10. An albatross is born from a single layer white egg that's laid on the ground and incubated by the parents in turn.
11. Beside humans, the tiger shark is the primary predator of albatrosses. Tiger shark are known to hunt young albatross chicks as they are learning to fly.
12. Longline fisherman are the greatest threat to albatrosses. The birds are often attached to the bait that the fisherman put out and become hooked on the lines, drowning a short time after.
13. Many researchers have described the albatross as the most legendary of all birds.
14. The Maori people used albatross wing bones to crave tattoos into their skin at ceremonies.



Sorce:https://thespinoff.co.nz/wp-content/uploads/2018/08/MK_NZ_Cornell-Tukiri-%C2%A9-9.jpg

Pratima Paudel
B. Sc. Environmental Science
2nd Year (Batch-2017)

WHY SHOULD WE CARE ?

In the early 1980s, Gurus repeatedly emphasized that 'The Earth does not belong to man, man belongs to the Earth. All things are connected like the blood which unites one family. Man does not weave this web of life. He is merely a strand of it. Whatever he does to the web, he does to himself. A nation that destroys its soils, destroys itself. Forests that are the lungs of our land, purifies the air and gives fresh strength to our people." These statements contributed to the need to realize the urgency of conserving the Nature – the plant, animal, water, air and the soil.

This year, the World Environment Day (WED) will be celebrated on the theme of 'Air Pollution' to further realize the importance of the clean air we breathe in and appreciate it and contribute to improve the air quality and work together to protect the Earth that we all share. With today's advanced science and technology, people can and are doing greater damages to the nature more quickly than ever. The effects of human-created environmental modifications are no longer restricted to a local or regional level, but are extending through the whole planet.

All of this requires a reasonable realization and translation of commitments into actions and moreover in a city like Kathmandu which is now being labelled as 'maskmandu': polluted city of the country. A city where 'all are superb', and all want to grab 'power and resources' but a culture of 'shifting responsibility' has matured over the years. Furthermore, nobody cares for 'cost of delay decision and no action'.

Yurisha Upadhyaya
B.Sc Environmental Science
4th year (Batch-2015)

"Rivers": Yet another dumping site

The rivers all around the world are being damaged by a constant and unprecedented accumulation of waste. The waste, mostly effluent from human activities, is brought to the rivers through unmanaged drainage, careless human activities. Waste is often carried far from where it is originated thereby polluting the entire river system. The litter that is mostly dumped is plastic which is non-biodegradable and has a marked effect on the environment.

Kathmandu has been suffering from unmanaged garbage for the last 20 years, when the city became increasingly crowded by people. People migrate from rural to urban area for better livelihood so, the management of garbage in the capital city is becoming a 'headache' for the government. Unlike in other cities of developed countries where waste is managed scientifically, the garbage here is left to rot in mainly riverbanks or disposed directly into the rivers, emitting stink and also posing a health hazards to the city dwellers. The disposal of waste has always been a problematic issue and dumping in the rivers site has always been by far the ultimate not the best solution.

The capital city is full of garbage contributing to bad and negative image among foreigners and visitors which must be looked upon considerably. There has been little or no effort to set up a permanent landfill site to dump the wastes accumulated in the capital. Wastes dumped in the river has degraded the natural quality of water and also made it unfit for any uses. The process of modernization characterized by the rapid industrialization and urbanization in both the developed and developing countries including Nepal has led to the problems relating to the dumping of wastes.



Not only in Nepal, but the issue of waste dumping in river is skyrocketing all around the world. Each year mining companies dump over 220 million tonnes of tailings, or hazardous mine waste directly into the rivers and lakes- putting communities, fisheries and entire ecosystem at risk. There are many rivers all around the world that are being excessively polluted. Yangtze River located in the northern Tibet suffers from many types of degradation: industrial run-off, siltation, untreated manure from pig farms, industrial effluent and sewage from municipal sources. In fact, in 2012, because of pollution, the river turned red. Similarly, River Tame located in the west midlands of the United Kingdom has the most micro plastic pollution, according to a survey done in, 2018. River Tame seems healthier today, though plastic pollution is still a major concern. The Cuyahoga River which runs through the congested urban environment, has been subjected to numerous forms of pollution, particularly industrial waste. The Buriganga River also known as the old Ganges, suffers from just about every type of pollution imaginable: chemical waste from textile mills. Domestic garbage, rotting fruit and vegetables, medical waste, sewage, dead animals, plastics and petroleum. It emits a foul smell and no aquatic life can survive in it. A better option would be to stop dumping garbage and various poisons into the river, although this option will be very costly. In the same way various other rivers like: Marilao River, Sarno River, Mississippi River, Citarum River, Doce River, Yellow River and Ganges River are used as the major dumping site despite their environmental or religious values.

Nevertheless, many attempts are being made for the sewage treatments in order to make sure that the contaminated water from the river does not get mixed with the environment. The treatment of wastes before the discharge can also be the major aid to reduce the river contamination. Moreover, laws and legislation to pollution should be strictly followed by all and people should be made aware that adherence to water laws are their own interest.

Gauri Shrestha
B.Sc Environmental Science
2nd year (Batch-2017)

Nijgadh International Airport: Boon or Bane



Background

By 2021, Nepal's Annual International air traffic is expected to reach 20 million passengers which can create deadly aviation crashes. This has compelled the Nepal government to build another international airport. And after studies based on technical and geographical aspects Nigjadh (Bara) has been recommended as the best location. Civil Aviation started carrying out EIA of NIA about 2 year ago. MOFE then approved the EIA on May 23, 2018. But the EIA has not been made available to the Media, Civil Society & Conversationalists. Later, the Nepal Forum of Environment Journalists managed to get the EIA report.

Introduction

Location: Kolhavi municipality, Nijgadh, Bara Province 2, Nepal.
Project includes an airport city and modern road connection between Nijgadh and Kathmandu.

Project Cost (In USD)	**1st phase: 545 million** **2nd phase: 2353 million** **3rd phase: 3467 million** **Total: 6565 million**
Runway	3600m*45m*2m
Capable to handle	Airbus-A380
Project land required	Air Side: 901.5 Land side: 450 Airport city: 105.3

Deadline: December 2025
It is said to be the 3rd biggest International Airport of the World. (Source: Prachanda Jung Shah, former Captain).
This will have Socio-economic, political and environmental Impacts.

Environmental Impact

1) 2.4 million trees are to be chopped down in 3 phases.
2) First phase: 769,691 Trees
3) GON assured planting 25 saplings for every single tree i.e. 62 million new saplings for the whole project.
4) 90 species of mammals directly affected, among which 5 are believed to be endangered. (Source : Roshan Sharma, Researcher at RMIT university, Melbourne, Australia)
5) Disturbance in ecological functions such as carbon storage, nutrient cycling, water and air purification and maintenance of wildlife habitat.
6) Quality Water management to the airport is another big project.
7) Socio-cultural benefits along with artistic and philosophical values to be disturbed.
8) Southern parts of Bara and adjoining towns of India will be prone to floods.
9) 3 districts to turn into desert with frequent floods. (Source: Chandra Kishore Jha, Journalist of Birgunj)

Social Impact

1) Living near airport exposes resident to the risk of heart diseases, hypertension and sleep disturbance as a result of increase blood pressure from noise pollution.
2) 750 bigga of a land is occupied by human community which will have to be displaced. (Source: NITV Media Pvt. Ltd.)
3) Use of Indian airspace is a major issue in itself. (Source: Prachanda Jung Shah, former Captain)
4) Will provide job opportunity for the locals after the completion.
5) Will destroy the fertile agricultural land of the locals depending only on agriculture which is just 1.5 km away from the project site.

Economic impact

1) Can uplift national economy from around 3% at present to 10% by 2030 with upgradation of tourism related infrastructure.
2) Can bring 2 million tourists by 2030.

Present condition

1) Although in past 3 years budget has been released for this project, nothing has been done yet.

2071-2072	2072-2073	2073-2074
50 cr.	50 cr.	150 cr.

2) Airport can be constructed in less than the estimated budget. (Source: CAAN)
3) The Chief Minister of Province 2, Lal Babu Raut, claims that chopping trees n the name of construction an international airport is not appropriate. (Source: Kantipur post,28 sep-2018)

4) Choosing Janakpur or Simara as an alternative should also be taken into consideration by GON. (Source: Arjun Dhakal, President, NEFEJ)

5) Are 4 international airports really needed? Two big airports are already being planned in Pokhara and Bhairahawa. . (Source: Kantipur Post, 23th Sept. 2018)

For Investors and Government Nigjadh International Airport is a project but for us it can be a disaster.

Anu Chapain
Pratik Baral
Punam Ghimire
Sadip Raj Pandey
Sushmita Shrestha
B.Sc. Environmental Science
3rd year (Batch 2016)

Green IT
"Green Mindset"

Modern technology
Owes ecology
An apology.

-Alan M. Eddison

Here comes the time when we question ourselves if we owe an apology to nature or not. This is where we look back to the prints that we have left in this long way of development. While taking technologies as a powerful source to improve standard of living it has mostly been burdensome to nature as it slowly kills everything with or without life in them. Technologies and innovation actually eats up plenty of natural resources, from the raw materials needed to manufacture them, the power used to run them, and the problems of disposing them at end of life.

With the rapid growth of technology, there has been a debate on if we are overusing technology in our lives. Some people see technology as a force that has escaped from human control while others feel that technology is continually improving our life. Modern world needs a modern way of handling things. As a solution to these problems the concept of green IT has been enthralling world since 1992 when U.S. Environmental protection agency launched Energy Star, a voluntary labeling program that helps organizations save money and reduce greenhouse gas emissions. We have often heard about Information Technology but most of us are still unaware about Green IT In the past few years, environmentalism is not showing signs of slowing down, the number of individuals, corporations, and governments that are jumping on a "green train" Is growing at the fast pace. Companies today have realized that going green has the potential to save millions of dollars in long-term, reducing the operational cost which can actually make Earth a better place to live.

Use of Web conferencing instead of traveling to meetings is an example of green way that saves huge amounts of time and money. According to ecopreneurist if every small business owner in the United States conducted one teleconference instead of a domestic business trip, we would save $25.4 billion dollars in travel expenses and 10.5 million tons of CO_2 in just one year. Similarly, e-marketing instead of paper marketing can also be a good choice for better world. So, now we can think about how much money and time we have been wasting since this long along with CO_2 emission.

In case of Nepal there are many such examples of Green IT. Many Environmental and non-environmental graduates are working in the field of Green IT with the common aim of achieving sustainable and stable future. Nepal is predicted to be following the policy promoting green economy with adaptable, simple, cost-effective and affordable technology in coming days. Some of the example of Green IT initiated in Nepal are:
Laxmi Bank installed solar lights in Bagmati Bridge, the Green Angel project has created green jobs for rural and young Nepali women helping them in a self-sustained business of making, and distributing cloth and paper shopping bags to replace use of polythene bags in Kathmandu, Dabur Nepal etc.

A small step from individual can change the scenario of Earth's future. With inspiration from the success stories of different people all around the world we Students of Environment Science at Kathmandu University have decided to take a small initiative and work sustainably. This year we are publishing our annual magazine in electronic forms too in order to reduce use of papers and also to cut down paper wastes. Though this step might seem very small but this is how we grow and learn. So, instead of business mindset let's use Green IT for the sake of nature and for sake of our life then we are no longer far from a sustainable planet that holds up dignity and pride of every human. Let's work sustainably and let's start seeking what we and our future generations deserve.

Sarana Tuladhar
B.Sc. Environment Science
2nd year (Batch-2017)


sdp
Retractable Pop-Up Wall
VICTORY






Conservation: A part of Hindu life

No one exactly knows how Hinduism came into existence but is estimated to date back to 4000 years and there are about 900 million followers in the world. Several Hindu mythological books guide its followers through its sayings. Conservation can be identified as an essential duty in the life of Hindus directly or indirectly.

The ancient way of living can be connected to conservation and protection through various sayings from its Vedas. "Only God has absolute sovereignty over all creatures of the earth; thus, human beings have no dominion neither in their own lives nor on any non-human life. Consequently, humanity cannot act as a governing body of God over the planet nor assign degrees of relative worth to other species", the idea of the Divine Being as the one underlying power of unity can be found in the Yajurveda (Yajurveda consists of prose mantras for worship rituals for Hinduism). This can directly be related to conservation of the Earth and all the units either living or non-living that reside on it.

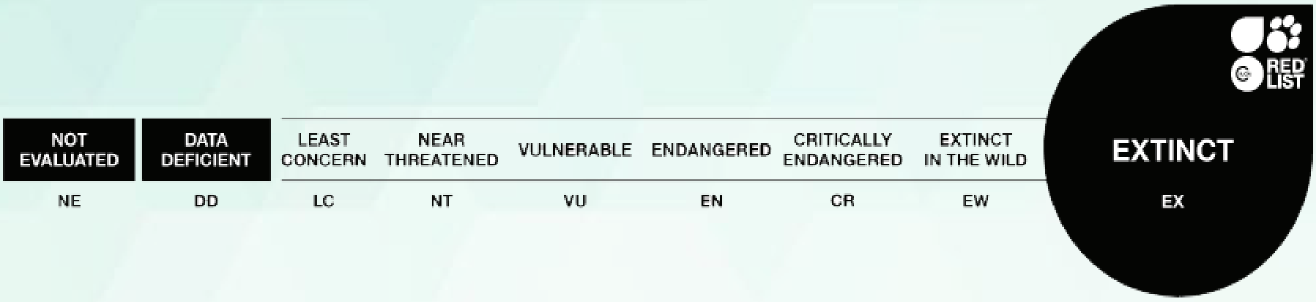
Another example can be taken from Rigveda (consists of Sanskrit hymns along with associated commentaries on liturgy, ritual and mystical exegesis), the plants have superpowers, with one entire hymn devoted to their praise, with reference to their healing properties. Well, it's actually true as well because plants have been used as medicine for several centuries now. It is still popularly believed that every tree has a Vriksa-devata, or 'tree god', who is worshipped with prayers, offerings like flowers, sweets, and encircled by sacred threads e.g. Hindus and Buddhists pray at Mahankal temple and encircle threads around the tree so that Lord Shiva saves them from bad times. Also, for Hindus, the planting of a tree is still a religious duty.

This Hindu way of life also talks about the pollution of the earth. Hindu doctrine has a clear concept of the ecosystem and it's functioning. In the Rigveda, it's written that 'The waters in the sky, the waters of rivers, and water in the well whose source is the ocean, may all these sacred waters protect me'. Sometimes even the sprinkling of pure water in the body was supposed to make a soul pure. People that use to get involved in the exploitation of water used to get punished according to the laws. Many other books can be found to support this claim for e.g. in Padampuran it is written that 'A person, who is engaged in killing life, polluting wells, and ponds and tanks, and destroying gardens, certainly goes to hell'. This can verify that pollution was supposed to be a hideous crime in the past.

Another most important aspect of Hindu theology associating to the treatment of non-human life is the belief that the Supreme Being (GOD) was himself incarnated in the form of various species of animals as well. The Supreme Being has himself incarnated himself in the form of fish, tortoise, boar, man-lion, etc. Also, Hindus believe that life of humans will be reincarnated in the form of animals or birds. Hindus believe that Lord Keshava i.e. Lord Vishnu will be pleased if no life on the planet is harmed (From Vishnupurana). To not eat meat is another part of the Hindu way and can be related to not killing and conservation of animal life. After Hinduism, when Buddhism and Jainism came to existence the protection of animal and bird species were boosted as well. The Buddhist and Jain rulers followed the path of protection of plants, animals, and birds so they can be an example to their followers.

In the ancient past Hindus and Buddhists were careful to observe and learn moral teachings and sayings of the Vedas regarding the conservation and protection of nature through various techniques like producing fewer wastes, not exploiting the natural ecosystem, less or no pollution water, air, and land, etc. In their cultures, not only the common person but also rulers and kings followed those ethical guidelines of Vedas and tried to create an example for others so that others can follow these ethical norms as well. But since the beginning of the new dawn in the twentieth century, the materialistic orientation in the World, particularly from the West has affected the cultures of the East countries where Hinduism mainly thrives. These countries have witnessed the exploitation of the environment by their own peoples for the sake of development, despite the strictures inherent in their religions and cultures. I believe that religion as a whole can recall the awareness in people about the conservation and protection of the environment in a large scale, it helps people understand that resources are limited and they have less control over the environment. If this imperious exploitation continues, nature will backfire.

Injal Bhattarai
B.Sc. Environment Science
3rd year (Batch-2016)

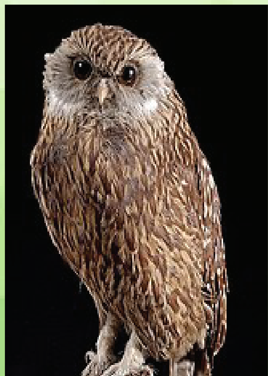



Carolina Parakeet
(*Conuropsis carolinensis*)


DODO
(*Raphus cucullatus*)


Great Auk
(*Pinguinus impennis*)

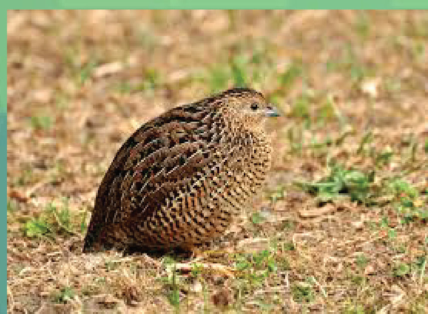

Labrador Duck
(*Camptorhynchus labradorius*)

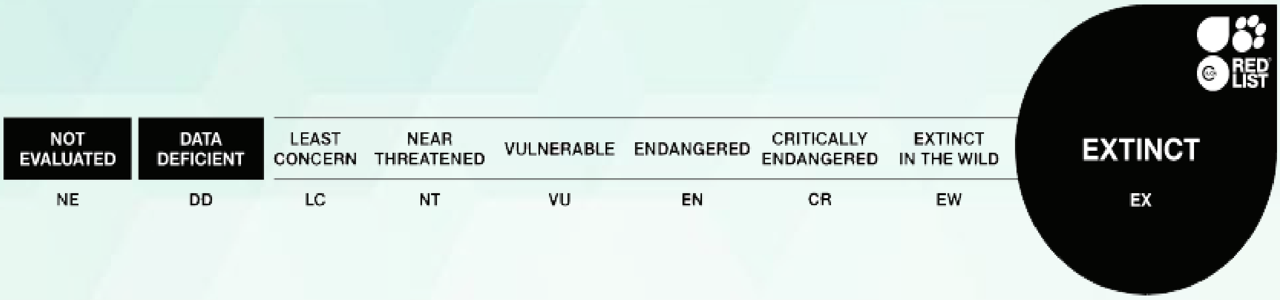

Laughing Owl
(*Sceloglaux albifacies*)


Laysan Rail
(*Zapornia palmeri*)


Mauritius Blue-pigeon
(*Alectroenas nitidissimus*)


Navassa Rhinoceros Iguana
(*Cyclura onchiopsis*)


New Zealand Quail
(*Coturnix novaezelandiae*)





Thylacine
(*Thylacinus cynocephalus*)



Steller's Sea Cow
(*Hydrodamalis gigas*)



Schomburgk's Deer
(*Rucervus schomburgki*)



Oeceoclades seychellarum



Seychelles Parakeet
(*Psittacula wardi*)



St Helena Olive
(*Nesiota elliptica*)

Source: IUCN redlist (2019)

Death is one thing,

An end to birth is something Else

-Luce Wilcox and Soule

Conserving our natural heritage – wetlands: a global perspective

Introduction

According to Wetland Reserve Commission "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions". Wetlands cover about 9% of the earth's surface. They are mainly of four types; swamps, marshes, bogs and fens.

Importance of wetlands:

Nature Conservation
Wetlands help conserve the biotic as well as the abiotic components, and reduce the impacts from storm damage and flooding, maintain good water quality in rivers, recharge groundwater, store carbon, help stabilize climatic conditions, and control pests. In other words, they act as kidney to other ecosystems.

Plants and Animals
Wetlands provide essential habitat for rare or important species as well as endangered species. Some plants and animals live only in particular types of wetlands, for example, in mangroves, salt marshes, etc. They are an important stopover for many migratory birds.

Agriculture and Development
Wetlands support agricultural activities by providing a source of water for irrigation, livestock and for domestic consumption. Pastures on inland floodplain wetlands are more productive than those in adjacent areas. They provide habitat for birds, which can play an important role in controlling pests on nearby farms, meaning there is less need for costly and harmful chemical sprays. Wetlands also support sustainable forestry: for example, some river red gum forests in New South Wales have been harvested for over 150 years.

Tourism Development
Many coastal and inland wetlands are popular locations for tourism and recreational activities such as swimming, boating, fishing, camping, and bird watching. Such activities can be a very reliable source of employment opportunity and income for people living around the wetlands.

Study and Research
Wetlands are used by schools, universities and the public to learn about the ecological importance of wetlands and other benefits and services that they provide to the community.

Carbon Sequestration
Wetlands are estimated to contain around 35% of global terrestrial carbon and act as sinks for carbon dioxide, and other greenhouse gases. This highlights the importance of protecting the wetlands which helps in limiting the impacts of climate change.

Threats
The importance of wetlands was not recognized in the past. People drained, dredged, dammed, or converted them into dry land .They filled them for lakes and water retention areas changing wetlands into cropland and pasture. The underlying resources were mined, insect life damaged; they were used for dumping grounds for waste and sewage. The threats of wetlands are divided into two groups- natural and anthropogenic.

Pollution
Drainage and run-off from fertilizers and pesticides introduce various toxins like mercury, nitrogen, and phosphorous to water sources, degrading the health and reproductive power of the species.

Invasive Species

Invasive species have had major impacts on the local aquatic plants and animals and can hinder the balance of the ecosystem. For example, the introduction of Nile Perch (a fresh water fish) to Lake Victoria has put many of the lake's native Cichlid species at the verge extinction. Since there may be no natural predators in the new ecosystem these species thrive and breed quickly, taking over the whole area.

Dams

Dams are constructed on the wetlands to store water for agricultural and irrigational purpose. They alter the natural flow of the water, disturbing the ecosystem. The dam wall itself blocks fish migrations which change the fish's spawning and rearing habitats. It also traps sediments, which are important for maintaining physical processes and habitats downstream of the dam.

Land Filling

The areas of wetlands are filled to provide more agricultural areas. Dumping landfill material buries hydric soils and effectively lowers the water table so hydrophilic plants cannot compete with upland plants. It is also done as an anti-malarial measure since wetlands are major sites for the mosquitoes to breed.

Natural Processes

Fire, floods, cyclones, and drought are all naturally occurring phenomena that have the potential to alter and damage wetland environments.

Conservation Measures

Some of the conservation measures are as follows.

1 .The non-wetland sites should be sought for development and the wetlands should be protected during construction.

2. The public and private conservation organizations can help inform and educate others about value of the wetlands and the benefits that we can get from a healthy wetland.

3. The undesirable materials entering the wetland through runoff from the surrounding landscape should be trapped or prevented.

4. Protection, preservation, and convenient utilization of the existing aquatic resources should be done.

5. Natural fixes and bioengineering techniques should be used in the possible places. It helps to prevent erosion, control sediment, and other pollutants.

6. Proper legislation should be made for the conservation of wetlands.

Conclusion

Wetlands are necessary for the numerous benefits and services that they provide us. Yet, study after study demonstrates that wetland area and quality continue to decline in most regions of the world. As a result, the ecosystem services that wetlands provide to people are compromised. Managing wetlands is a global challenge; therefore all concerned people should know the value of conserving this ecosystem for the mutual benefit of human kind.

Cizal Gautam
B.E. Electrical engineering
1st Year (Batch-2018)

Miles to go for achieving a green democracy

As Nepal goes fully federal, the instrumentalities of the state should not shy away from investing in protection and promotion of environment citing lack of institutional capacity. The people in the Republic could sense the burn of environmental pollution: losses in agro-based industries and incomes; hunger and malnutrition and the associated pressure on the national life.

In a bid to slam the pollution, the Constitution of Nepal hosts a plethora of provisions for advancing the cause of environmentalism. The charter explicitly and authoritatively declares that the right to clean environment is a fundamental right. Article 30 envisages that every citizen would have an inherent right to live in a healthy and clean environment.

In a major breakthrough, the Constitution ensures that the victim of environment pollution ‘shall have right to’ seek compensation from polluters [Article 30(2)]. In doing so, the Constitution succeeds to acknowledge the celebrated concept of “polluter pays principle.” The newly enacted Country Criminal (Code) Act, 2018 could be invoked for punishing the polluters. To mention a provision: Section 111 prescribes punishment for persons causing water pollution. It provisions that the polluter would be punished for an imprisonment of a term which may extend up to three years or fine of NPR 30,000 or both.

The federal units have been conferred with the power to enact laws at their competence for the protection and promotion of green democracy. In this context, the Central government under entry 27 of Schedule-V; State governments under entry 19 of Schedule-VI; and both governments under entries 12, 18 & 23 of Schedule-VII have mandates to act on national ecology and; of course, on sanitation, clean and healthy water, wildlife conservation or forestation. Nevertheless, there are ways that they could partner with private citizens as well as NGOs for realizing the goals of environmental democracy.

Meanwhile, at international stages, the United Nations on November 10, 1980 emphasized on the purity of drinking water in “International Drinking Water Supply and Sanitation Decade” and made an obligation on the signatories to provide clean drinking water to their citizens as access to drinking water has been globally termed as fundamental rights. The UN Conference held at Stockholm felt the need for a common outlook and principles to inspire and guide the world in preservation and enhancement of the human environment which will in/directly lead to the economic development of the world. Reaffirming the objectives of this declaration, the Rio Declaration on Environment and Development, 1992 was held with a view to establish a new and equitable global partnership to combat with environmental pollution.

The Convention on Biological Diversity, 1992 is chiefly concerned with the intrinsic value of biological diversity. Convention reaffirmed that the states have sovereign rights over their own biological diversity and it casts an obligation on the signatory states to use their biological resources in a sustainable manner.

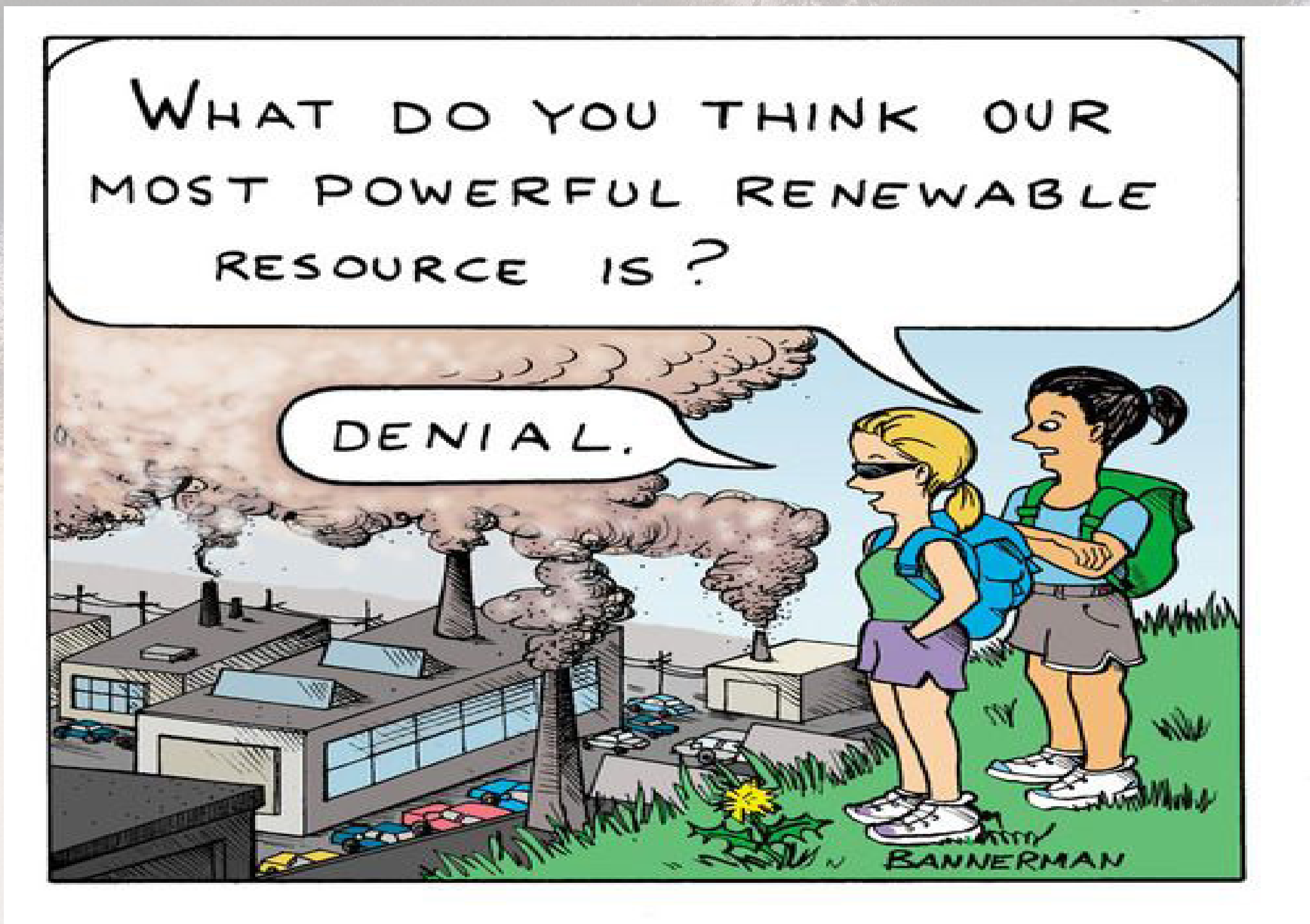
The atmosphere of Kathmandu remains a deadly affair for the people. The environmental damage is causing public nuisance in a broad daylight. In the case of Municipal Corporation of Ratlam v Birdhi Chand (1981) the apex Court of India held that the environmental damage is in the nature of Public Nuisance. The Court observed that the liability would be imposed on the public authorities for their failure to mitigate the nuisance caused by environmental pollution.

While celebrating the 44th World Environment Day in 2018 with the theme of “Beat Plastic Pollution”, it was high time for us to evaluate whether we succeeded in observing the international commitments made at different stages. An added responsibility lied on India to plan a better future environment since India had been declared as global host by the United Nations for 2018 Environment Day celebration. It’s a crucial time for the world community to reaffirm their fresh

commitment towards a cleaner and sustainable planet, without which the themes of World Environment Day would not materialize. Nepal's Constitution explicitly confers right to clean and healthy environment on every citizen. This way, the Supreme Court (under Article 133) and High Courts (under Article 144) are under obligation to ensure judicial remedies on the questions relating to violation of fundamental rights.

It's a truism that the mere judicial pills could not be a universal remedy for all environmental ills. The administrative and police accountability, grassroots level governance, public consciousness and civic sense and corporate social responsibility are also required while dealing with environmental challenges. Yet, the role of judiciary is crucial.

Amit Kumar
BBM, LL.B Kathmandu University
5th year (Batch 2014)



My memorable trip to the southern end of South America: To the world's end

Famous American essayist, lecturer, and poet Ralph Waldo Emerson once said "Do not go where the path may lead. Go instead where there is no path and leave a trail". My trip to the world's end on "Navarino Island" (Southern end of South America) Southern Chile actually fits close to what Emerson's said. The Chilean city, Puerto Williams is considered "the world's end". Puerto Williams is the capital of the Chilean Antarctic Province, and the world's southernmost town. At 550 latitude, it represents the extreme southern end of the world and is home to the world's southernmost rainforest.

I was always kind of wondering and lacking some memorable experience in camping, hiking and backpacking which was profoundly resolved after my mesmerizing trip in the most pristine wilderness at the UNESCO Cape Horn Biosphere Reserve on Navarino Island. It was on December 27, 2014 that I took an overnight flight with a student group from the University of North Texas (UNT) from Dallas-Fort Worth International Airport to Santiago, Chile. Then a connecting flight of about 3-1/2 hours onto Punta Arenas, we viewed the most awesome beauty of nature, and landscapes, along with the area's beautiful architecture. Two days of amazing experiences in Punta Arenas kicked off the trip with us full of enthusiasm, excitement and an adventurous spirit. Within two days, we visited University of Magallanes (UMAG), Reserva de Magallanes, the Otway Penguin Colony and attended a series of seminars at the Hain Hostel.

Our next destination was Puerto Williams, the main port town on Navarino Island. More than half of the students and some faculty travelled by Ferry, navigating along the Darwin Cordillera. Along this route, they experienced the beauty of the glaciers, waterfalls, and rainforest that dotted the fjords. They were accompanied by penguins, albatrosses, and a host of other inhabitants who call this amazing place home. I had an opportunity to fly in a small plane which carries 14 passengers at a time, and takes 1-1/2 to two hours depending upon wind velocity and weather at flight time. While flying you have the perspective of where the glaciers, the mountains, the rivers, lakes, and forest meet to create a beautiful landscape. During this journey, I imagined how these experiences might be similar to a mountain flight in Nepal, my homeland.



Photo 1: ***Penguin Colony at Otway (north of Punta Arenas).***

Tracing Darwin's Path (TDP) study abroad field course is one of UNT's most successful among many study abroad field courses. The course took place from December 29, 2014 to Jan 18, 2015. The field course, "TDP" has been co-taught by UNT and UMAG for the last 9 years. A total of 30 students from three U.S. universities and three Chilean universities participated with my group; University of North Texas (UNT), Buena Vista University (BVU), University of Connecticut (UConn), and the three Chilean universities were University of Magallanes (UMAG), Universidad de Chile, Pontificia Universidad Católica de Chile with 8 faculty members and 1 visiting faculty from Rikkyo University in Japan. The goals of the course were to provide students with an interdisciplinary research, conservation, and educational experience at one of the most pristine wilderness areas remaining in the world. The course explored ways of defining, studying, communicating, and-conserving biocultural diversity. These goals were achieved by exposing students to a first-hand experience in the Omora Ethnobotanical Park (OEP), a long-term socio-ecological study site that serves to link society and development with biodiversity, history, and ecosystems in the Cape Horn Biosphere Reserve (CHBR).

Not only is the TDP course special in its own right, my trip was especially unique for two reasons: We had the opportunity to host the International Association of Bryologists (IAB) Conference, which was held in the CHBR at OEP on Navarino Island, and we were visited by the President of Chile, Ms. Michelle Bachelet who pledged her support for the program, and the future success of the Cape Horn Research Center which is targeted to be built and opened in 2017. During this wonderful opportunity, I also had the pleasure to meet the Rear Admiral of the third zone of the Magallanic Antarctic region, Chilean Navy, Mr. Felipe Garcia-Huidobro. One of my most memorable moments was having a toast and dinner with the Chilean President and Rear Admiral of the Chilean Navy.



Photo 3: ***Chilean President Ms. Bachelet delivering her speech during the world IAB conference in the southernmost town***

After the world IAB conference, we had a great opportunity to travel via ferry with the Admiral of the Chilean Navy, Mr. Garcia-Huidobro to Wulaia Bay to see Darwin's Museum, and later climbed the highest peak, Cerro Bandera on the island. With a human population of only a handful of people, the CHBR leads work in science, eco-tourism, education and aesthetic value in the biosphere reserve, and at the same time is one of the world's last pristine wilderness areas and home to many species of mosses, lichens, aquatic invertebrates and birds. Due to its difficult accessibility and extreme harsh weather, this pristine place is a place where man has not exploited the natural resources and is still safe and free of pollution.

It was an incredible three weeks in the southernmost town (Puerto Williams) of the world. Truly amazing to see a small town squeezed between two oceans and split by the tail of the Andes. Navarino Island is wild and a rugged land, filled with breathtaking landscapes and eye-catching scenery. It was absolutely amazing to see this wonderful island with extreme diverse landscapes and ecosystem in person. This memorable trip provided me a fascinating perspective on convergence and divergence of nature and entire ecosystem in the North & South Americas.



Photo 2: ***Rajan Rijal, in front of the Field Station (this Field Station is well equipped to conduct stream ecology and ornithology research).***



Photo 4: ***Rajan Rijal with Admiral of the Chilean Navy, Mr. Felipe Garcia-Huidobro, during the world IAB conference in the southernmost town.***

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FILMS101: A Watchlist for Budding Environmentalists

Have you ever been so awestruck by a movie that you kept on reading its reviews after midnight? How often do you get a film that you go on telling about to your buddies? And how about film(s) on environmental issues that got you thinking???
Good movies like good books and good people go on a long way to define our lives. Good movies hold the power to stir our conscience, to inspire change. Some movies find a way to our soul and leave a lasting imprint on our being.
I have compiled a selection of films on environmental issues that I thought is worth sharing with our generation of environmentalists (not just environmental science students). There is no particular order of critical acclaim or popularity which to follow. Just look up IMDB before you watch these movies, and explore further on so many other great films that are not mentioned in this loose list.
Who knows a film one day will help you find your purpose in life?

Wall-E (2008)



(Animation, Adventure, Sci-Fi)
Director: Andrew Stanton
You can't help falling in love with the solitary trash-picking robot Wall-E who is on a mission to clean up a post-apocalyptic planet Earth deserted by the humans.
Themes: consumerism, corporatism, waste management, human environmental impact, obesity, global catastrophic risk and nostalgia.
Further watching: Finding Nemo (2003), an animation film by Stanton

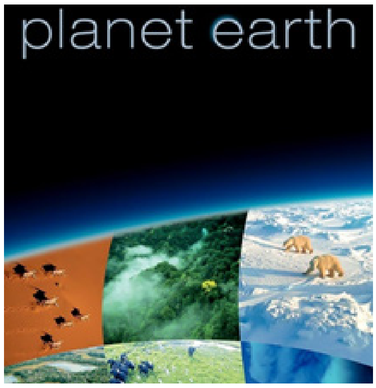
Racing Extinction (2015)



(Documentary, Adventure, Drama)
Director: Louie Psihoyos
The heartrending depiction that human greed and apathy is pushing earth's biodiversity to the 'sixth mass extinction' and how a small group of people – scientists, activists and journalists are showing the rays of hope for the future of the planet. Watch people like Elon Musk and Nat Geo photographer Joel Sartore (The Photo Ark project) at their work for the planet.
*Screened by NSCS during World Environment Day 2016 at CV Raman, Kathmandu University.
Themes: Anthropocene, poaching and illegal wildlife trade, extinction crisis, activism, environmental crisis
Further watching: The Cove (2009), a documentary by Psihoyos

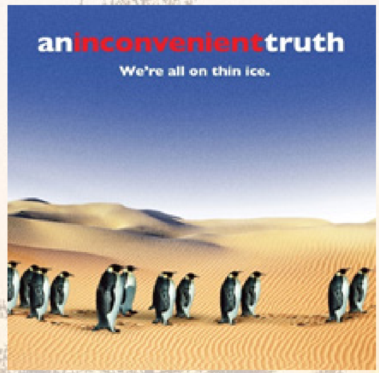
Planet Earth: I and II (2006, 2016)

(TV Mini-series)
Narrator: David Attenborough
Five years in the making, it was the most expensive nature documentary series ever commissioned by the BBC and also the first to be filmed in high definition. It shows the pristineness and grandeur of the Earth's ecosystems and biodiversity so successfully that the only criticism of late is that it fails to show the consequences of widespread environmental crisis and human-inflicted damage to the natural environment. The behind the scenes give an idea of the lengths the makers went to bring alive the natural world.



Themes: Biodiversity, Ecosystems, Evolution
Further watching: Other installments of the BBC Planet Earth franchise: Blue Planet (2001), Planet Earth: The Future (2006), Earth (2007), Frozen Planet (2011), Blue Planet II (2017) (upcoming and in development: Perfect Planet, One Planet: Seven Worlds, Planet Earth III, Frozen Planet II)

An Inconvenient Truth (2006)



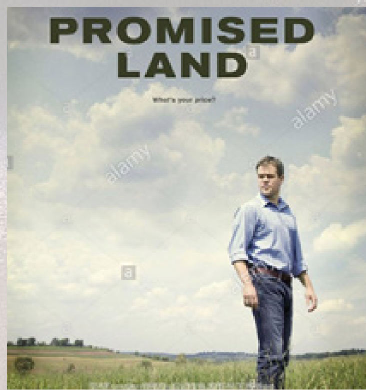
(Documentary)
Director: Davis Guggenheim
We follow Al Gore, former US vice-president in his passionate lecture series and campaigns to raise awareness and call for urgent action from the wider public to curb human-induced global warming and environmental destruction. The commitment, energy and profound understanding of a politician in environmental issues is contagiously inspiring.
Themes: Global warming, environmental crisis
Further watching: An Inconvenient Sequel: Truth to Power (2017) is a follow-up on An Inconvenient Truth



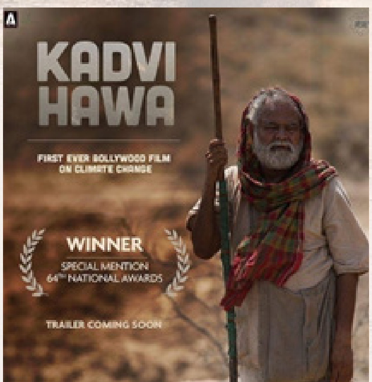
Food, Inc. (2008)

(Documentary)
Director: Robert Kenner
"YOU'LL NEVER LOOK AT DINNER THE SAME WAY!!!" Rethinking the impact of food on the environment: how America's corporate controlled food industry has a massive environmental footprint.
Themes: Corporate farming, intensive farming, meat industry, food labeling regulations
Further watching: Cowspiracy: The Sustainability Secret (2014) and The Story of Stuff (2007) – both promote sustainability while revealing issues of environmentally damaging production and excessive consumerism.

Promised Land (2012)



(Drama)
Director: Gus Van Sant
A salesman for a natural gas company finds that he is just a pawn for his company planning to tap the oil reserve by displacing people from a small town.
Themes: Resource exploitation, indigenous rights, displacement, fracking (hydraulic fracturing)
Further watching: First Reformed (2017) is a drama thriller in which worldly concerns arising from environmental destruction make the characters quest



Dark Wind (Kadvi Hawa) (2017)

(Drama)
Director: Nila Madhab Panda
How the lives of two characters intersect as their families suffer from apparently opposite consequences of climate change – severe drought in Rajasthan and coastal flooding in Odisha. Two ends of the spectrum – water in scarcity and water in excess cause different but equally painful plights to people in two sides of India.
Themes: Climate change, drought, climate-induced disasters, coastal flood
Further watching: Bhopal Express (1999) by Mahesh Mathai and Bhopal: A Prayer for Rain (2014) by Ravi Kumar based on the infamous Bhopal Gas

Jal (2013)



(Drama, Action)
Director: Girish Malik
The desperate search for water in the Rann of Kutch, Gujarat where a water diviner tries to find water for the village and a foreign birdwatcher tries to save the flamingo population from deaths in a saltwater lake.
Themes: water scarcity, conflict for natural resource

The Day After Tomorrow (2004)



(Sci-Fi, Adventure, Action)
Director: Roland Emmerich
A thrilling tale of a future world that somehow plunges into a new Ice Age. Food for thought: How relevant is the possibility in the light of global warming?
Themes: Ice age, survival, global environmental change
Further watching: Before the Flood (2016): after his appointment as the UN Climate Ambassador, Leonardo DiCaprio travels around the globe to observe the causes and consequences of climate change, and human-inflicted environmental destruction as he recounts his personal experience.

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Municipality Solid waste management

Let's look around our surroundings. What did you see? Is it clean/green or neither? If you see neither then what's our role being a social animal. Let's think on this.

After an industrial revolution, we know the world has changed drastically. It's a boon for mankind but at the same time it has been blooming as a curse to mankind. One of the major pathetic outbreaks is Municipal Solid Waste i.e. waste generated by each and every individual of this planet earth. Though waste can be maneuvered into useful source of energy, some manage to do it and some not.

Banepa Municipality is a small historical town which lies 25 km away from Kathmandu valley connecting capital city to Tibet in the east via Araniko Highway and to India via B.P. Koirala Highway. It is a fast-growing business hub currently and also a place for business earlier comprising of 8 different temples and ponds. A place with its own unique culture, festivals and tradition. Despite that Banepa is turning out to be a pathetic spot especially in solid waste management.

Municipal Solid Waste Management is one of the most emerging issue in Banepa. It is also one of the top high budgeted expenditure of the Municipality. On last fiscal annual financial report published by Banepa Municipality, the amount of expenditure for Municipal Solid Waste and Sewerage is equivalent to NRs.5,000,000. Though, the amount seems reasonable but the problem is not solved yet and becoming severe day by day. It is roughly estimated that Banepa Municipality generates about 30 tons of waste every day. Most of this waste ended up in dumping site based on Shree Khandapur. Currently, it has been closed due to public outrage and is transported to Sisdole land fill site. Although, municipal solid waste was collected once a week or month but within these time frame, waste generated are not managed correctly. Households waste are not segregated and is dumped into one bag or polyethene. In addition, waste is dumped in an open place far from their own households. Due to this littering of waste, residents are prone to air and water borne diseases (influx of different types of bacteria). At the same time, it has also degraded cleanliness and hygiene of city and problems of sewerage blockage, clean river water, loss of aquatic and terrestrial lives and others. This cycle of waste mismanagement has created a lot of nuisances especially to biotic (plants, animals, humans) and abiotic (air, water and soil) components. Outbreak of disease is being seen currently.

We came across problems generated by Municipal Solid Waste in the community. Now, let's focus on how we can get rid of these problems i.e. THE SOLUTION. We can take traditional and technology approaches. Traditionally, what we need to do is to segregate municipal solid waste into compartments especially biodegradable, wet, and non – biodegradable, dry waste using two different collection bins. Biodegradable or natural waste collected can be converted into compost manure by treating biodegradable waste under aerobic conditions whereas manmade

or dry waste can further be segregated and reused, recycled and reduced. For the proper management in Municipal Level, a collection center can be established in every ward with active board members for managing municipal solid waste. Waste are segregated and processed in collection center for compost manure preparations and other non-biodegradable for recycling, reusing and reducing. For transportation, residents must carry and transport their segregated household waste to the collection center. On collection center, man powers will operate waste for further manure preparation or contacting with scrap dealers or compost manure preparing company. On the other hand, people can also manage their household waste in their own homes by making compost manure. Roof Kitchen gardening can be done and compost manure can be utilized. About 60-70 % of daily waste from kitchen can be transformed into manure in every households. For this, an individual must be very aware about their waste and the process to turn it into manure.

The following are the code of conduct which needs to be followed by residents of community.

Household Practice (Solid Waste Management)

1.We have to put a stop to littering household waste outside of the house. This habit must be changed.
2.Abandoning the use of plastics while purchasing products from market. We must develop a habit of carrying own bag while shopping and reusing it frequently.
3.We must manage our waste in a container provided by municipality.
4.Participation in Solid Waste Management Program organized by various organizations, institutions, government level and others.
5.Dead bodies of animals must be buried deep beneath the ground, away from the source of river.
6.Biodegradable waste must be converted into compost manure and other non – biodegradable waste such as plastics, metals etc. must be reused or recycled.
7.Humbly request our neighbors to not litter.
8.Bio degradable waste generated from home must be plunged into kitchen garden by making compost manure.
9.Emphasize reusing of the materials to reduce solid wastes.

Code of Conduct for Community

1.Community must be aware about the nuisances which will be created by solid waste.
2.Compost Manure Plant must be prepared by forming a committee.
3.Adolescents and youths must be encouraged to participate in cleanliness program.
4.Funds must be collected from community and municipality for conducting cleanliness programs.
5.Products can be prepared from reusing of non-biodegradable waste. A creative committee can be formed.
6.Manpower required for conducting solid waste campaign must be communicated to concerned stakeholders.
7.If there is any problem concerning solid waste management, it must be communicated to ward level.
8.Public participation for cleanliness program.
9.Media sector must inform the locals and communities to manage waste and put a stop to waste littering.

In case of failure of traditional approach, we can adopt most advance forms of technologies such as mixed incineration, plasma gasification and anaerobic digestion. In mixed incineration, MSW is directly combusted in excess oxygen environment at temperatures 850°C and 1110°C. The end product derived from the combustion of waste is hot combusted gas – composed primarily of Nitrogen (N_2), Carbon Dioxide (CO_2), Water (H_2O), Oxygen (O_2) and non-combustible residues which flows through a boiler to produce steam to drive the steam generator to produce electricity. In case of anaerobic digestion, degradation of organic matter occurs in anaerobic conditions or in absence of oxygen. Several types of bacteria break down the complex organic waste in different stages producing methane gas used for energy generation. In plasma arc gasification, MSW is subjected to a high temperature pyrolysis type of process (7,200°-12,600°F). The organic fraction is converted into syngas (Carbon Monoxide and Hydrogen) and inorganic fraction is converted into rock like materials. The high temperature is created by plasma torch. The syngas is used to produce electricity and inorganic materials in MSW are converted into vitrified slag which is a glassy material mostly composed of metal and silica used for floor tiles & insulation. These are the currently practiced worldwide technologies.

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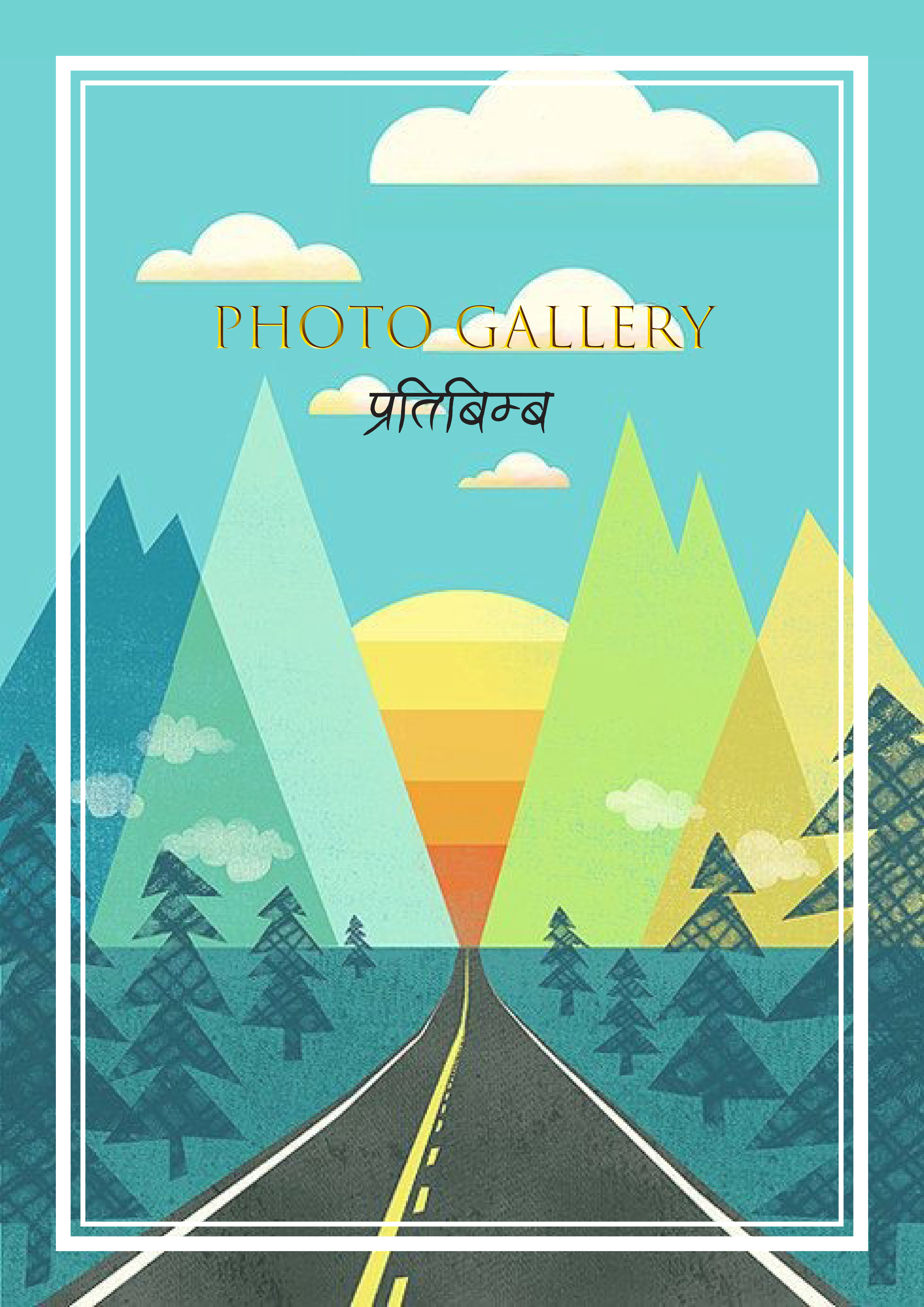
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PHOTO GALLERY
प्रतिबिम्ब

Department of Environmental Science and Engineering



(From left to right): Sakul Dhakal(Lab technician) , Associate.Prof.Dr.Kumud Raj Kafle,Mrs.Binita Thapa (Lab technician)
Assistant.Prof.Dr. Nani Raut, Assistant. Prof.Dr.Smriti Gurung, Prof.Dr. Bhibhuti Ranjhan Jha, Associate .Prof.Dr.Bed Mani Dahal,Associate.Prof.Dr.Rijan Bhakta Kayastha, Assistant.Prof.Dr.Kundan Lal Shrestha, Assistant .Prof.Sabita Aryal Khanna



(From left to right):Mr.Rajendra Bhandari, Mr.Subodh Luitel(Lecturer), Mr.Rakesh Kayastha, Assistant .Prof.Sandeep Shrestha



BATCH-2015



BATCH-2016



BATCH-2017



BATCH -2018
































Hike -2017



Rain rain go away,
come again another day



Hike-2018



Hike-2018



Trash Tag Challenge



School visit



Futsal-2018



WED-2017



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शिक्षा, विज्ञान तथा प्रविधि मन्त्रालय

फोन नं. {

पत्र संख्या:- ०७५।०७६
चलानी नं.:- २६०९

नेपाल सरकार
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सिंहदरबार,
काठमाडौं, नेपाल ।

मिति : २०७६।०१।१९

विषयः वधाई तथा शुभकामना प्रदान गरिएको बारे ।

श्री अन्तराष्ट्रिय पशुपति अन्नपूर्णा आश्रम,
केन्द्रिय कार्यालय, काठमाडौं ।

उपरोक्त सम्वन्धमा अन्तरराष्ट्रिय पशुपति अन्नपूर्णा आश्रमले नेपाल भरी गुरुकुल, वेदविद्याश्रम, सरकारी स्कुलहरुमा खाद्यान्न, लत्ताकपडा शैक्षिक सामाग्री सहयोग गर्दै आएकोमा यस आश्रमको मिति २०७६/०१/०३ को निर्णयानुसार आगामी ५ वर्ष सम्मकालागि अहिंसावादी शिक्षाप्रेमी धनाड्यको तर्फबाट निम्नलिखित पदमा निम्न लिखित व्यक्तिहरु नियुक्ती हुनु भएकोले नेपाल सरकार शिक्षा, विज्ञान तथा प्रविधि मन्त्रालयकोतर्फबाट हार्दिक वधाई तथा शुभकामना प्रदान गर्नुका साथै तपाईहरुको कार्यकालको सफलताको कामना गर्दछु धन्यवाद ।

सि.नं.	पदाधिकारीको नाम, थर	पद	कार्यक्षेत्र
१	विशिष्ट श्रेणीका राष्ट्रिय समाजसेवी प्रा.डा. जगदीश वैद्य	अध्यक्ष	समाजसेवा क्षेत्रमा राष्ट्रिय सम्मान प्राप्त व्यक्ति तथा शिक्षाप्रेमी
२	प्रा. श्यामबहादुर डंगोल	वरिष्ट उपध्यक्ष	पूर्व संयुक्त राष्ट्रसंघ प्रतिनीधि
३	प्रा. महेशरत्न तुलाधर	उपाध्यक्ष	उद्योगपति
४	प्रा. उर्मिला डंगोल	उपाध्यक्ष	महिला समाजसेवी
५	प्रा. वेदव्यास सिंह	उपाध्यक्ष	उद्योगपति
६	प्रा. सजनी प्रधान (श्रेष्ठ)	उपाध्यक्ष	महिला शिक्षाप्रेमी
७	प्रा. शान्ति वैद्य (जोशी)	उपाध्यक्ष	महिला शिक्षाप्रेमी
८	प्रा. कमला महर्जन	उपाध्यक्ष	महिला शिक्षाप्रेमी
९	प्रा. हेमकुमारी सिंह	उपाध्यक्ष	महिला शिक्षाप्रेमी
१०	प्रा. पुरुषोत्तम अर्याल	उपाध्यक्ष	व्यापारी
११	प्रा. उषा तुलाधर	उपाध्यक्ष	महिला शिक्षाप्रेमी
१२	प्रा. ई.पदमलाल महर्जन	सदस्य सचिव	पूर्व संयुक्त राष्ट्रसंघ प्रतिनीधि
१३	प्रा. जीतलाल डंगोल	कोषाध्यक्ष	पूर्व राष्ट्रसेवक
१४	प्रा. ईन्दिरा जोशी	सचिव	महिला शिक्षाप्रेमी
१५	श्री कमला गौतम	सहकोषाध्यक्ष	महिला शिक्षाप्रेमी
१६	श्री नरेन्द्रमान महर्जन	सदस्य	शिक्षाप्रेमी
१७	श्री पित्ताम्वर पाण्डे	सदस्य	शिक्षाप्रेमी
१८	श्री थानेश्वर थापा	सदस्य	शिक्षाप्रेमी

अन्तर्राष्ट्रिय पशुपति अन्नपूर्णा आश्रमको आगामी ५ वर्षिय कार्यकालका लागि माथि उल्लेखित कार्यक्षेत्रका व्यक्तहरु उल्लेखित पदमा नियुक्त हुनु भएकोमा
हार्दिक वधाई तथा शुभकामना व्यक्त गर्दछौं ।

खगराज बराल
सचिव

प्रा.डा. जगदीश वैद्य
अध्यक्ष
तथा
अन्तर्राष्ट्रिय पशुपति अन्नपूर्णा आश्रम परिवार

WE CAN'T STOP BREATHING, BUT WE CAN DO SOMETHING ABOUT THE QUALITY OF AIR

स्वच्छ वायु,
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